Comparative ICT Sector Performance Review 2009/2010

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The network consists of 18 African countries, and the national sector performance reviews lead by the network members below form the basis for this comparative analysis: Benin (Dr Augustin Chabossou); Botswana (Dr Patrica Makepe); Burkina Faso (Dr Pam Zahonogo); Cameroon (Prof. Olivier Nana Nzèpa); Cote d'Ivoire (Prof. ArseneKouadio); Ethiopia (Dr Lishan Adam); Ghana (Dr Godfred Frempong); Kenya (Prof Tim Waema); Mozambique (Francisco Mabila); Namibia (Dr Christoph Stork); Nigeria (Prof. Ike Mowete); Rwanda (Albert Nsengiyumva); Senegal (Mamadou Alhadji); South Africa (Dr. Alison Gillwald); Tanzania (Bitrina Diyamett); Tunisia (Prof Farouk Kamoun); Uganda (Dr. Nora Mulira); Zambia (Shuller Habeenzu).

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Executive Summary

Although the telecommunications sector in sub-Saharan Africa, particularly the mobile market, has experienced significant growth, outcomes have been sub-optimal in many respects. While some markets, such as Ghana, Kenya, Nigeria and Senegal, are very dynamic, as a whole Africa continues to lag behind other regions both in terms of the percentage of people with access to the full range of communications services and the amounts and manner in which they can be used – primarily as a result of the high cost of services. The cost of wholesale telecommunication services as an input for other economic activities remains high, escalating the cost of business in most countries. In addition, the contribution of ICT to gross domestic product, with some exceptions in North Africa, Senegal and the Indian Ocean island states, is considerably less than global averages and what it would be if it were being used more widely as a lever for economic growth on the continent.

In many of the 17 countries in this review, the national objectives of achieving universal and affordable access to the full range of communications services have been undermined either by poor policies constraining market entry and the competitive allocation of available resources; weak institutional arrangements with a dearth of technical capacity and competencies; and, in some instances, regressive taxes on usage. As a general trend across the continent, while the voice divide is decreasing, the Internet divide is increasing and broadband is almost absent on the continent.

The fixed-line sector continues to show no signs of recovery as most countries experienced negative growth between 2006 and 2008. Failure to privatise the fixed-line segments, extended monopolies when privatisation took place, and ineffectual regulation of the incumbent, usually dominant at least in the backbone of most countries, if no longer in voice, account for low penetration rates. These, together with sequencing problems in the policy, the delayed establishment of autonomous regulators, and the failure to open up markets prior to privatisation with associated high prices, have undermined the extension of fixed services. This is in the face of rapidly deployable wireless technologies by new market entrants where markets were opened, with innovative pricing that tapped into the demand for low access charges and small denomination pre-paid purchasing vouchers, making it very difficult for fixed networks with huge sunk costs and high access prices to compete both on cost and the mobility of new phone services.

The trend across the countries under review indicates a decline in the number of fixed lines. Even while being earmarked for over a decade as the network and service to facilitate universal access, fixed-line operators have not been able to meet basic communication needs. In cases where fixed lines are available, such as in urban areas, they are yet limited and of poor quality. With a few exceptions, such as Nigeria, Côte d'Ivoire and Ethiopia – which shows marginal improvements – fixed line penetration figures are static or declining, with most countries' penetration rates standing at less than 3% of the population. The low penetration of fixed lines, however, has created opportunities for 'fixed-mobile' CDMA operators to provide wireless local loop services.

While mobile penetration figures have doubled or even tripled since 2006 (making it the fastest growing region in the world according to the International Telecommunications Union), these are mostly off very low bases. Mobile penetration levels in many countries remain below the 40% critical mass believed to trigger the network effects associated with economic growth. Of course several notable exceptions can be found in Ghana, Kenya, Nigeria, Tunisia and South Africa, many of which are perceived to be reaching maturity. However, when supply-side data on the number of SIM-cards is critically analysed, it is evident that the equation of SIM cards with subscribers or percentage of the population, as in tele-density measures, is problematic. The high 'penetration' figures result form the use of multiple-SIM cards, resulting in over-counting, often by several million. Despite over-counting, growth in the mobile segment is indisputably high, though uneven, across all countries. This can be attributed to a number of factors including the rise in the number of operators; intense competition in some markets, which has driven down mobile prices; the proliferation of low cost handsets; operator network expansion; and the introduction of differentiated products. This has allowed for the entry of previous non-consumers into the markets, while constantly provide new services for the top end of the market which drives the uptake of new services.

Mobile operators are also leaders in innovation at an applications level, particularly in the development of value added services like mobile payments, which has become a necessary offering to avoid churn and ensure customer loyalty. Although the mobile telephony is the fastest growing segment, affordability of services remains a challenge. Mobile penetration rates continue to demonstrate significant growth but these figures tend to mask the fact that millions of Africans still do not own their own means of communication. Despite the high proliferation of low costs

handsets, in some poorer sub-Saharan African countries like Uganda and Tanzania penetration remains relatively low. While improved affordability of devices is driving up take, pricing of services remain a constraint on the usage, particularly when these are effected by the regressive special taxes levied on communications and equipment, which is as high as 30% in Uganda. As such the negative effect of taxes on affordable access is one of the key issues on the regulatory agenda.

At a continental level, sub-Saharan Africa trails North Africa on a range of indicators, with fixed-line penetration as high as 32% in some North African countries and Internet penetration greater than 40% as a result of the deployment of mobile wireless technologies (OECD 2008). In sub-Saharan Africa, the Internet market is in its infancy, with penetration rates still below 3% on average, though a greater percentage gain access through public access points. Broadband uptake trails even other developing regions in the world with a penetration rate below 2%. Tunisia had the highest rate with 34.07%, followed by Nigeria with 28.43%. Kenya, Uganda and South Africa had between 7% and 10%. The broadband market is nascent with penetration rates lower than 1% across the continent Tunisia, again, was the broadband leader among the countries under review.

Low penetration rates are mainly a result of the prohibitively high costs of Internet services. Unsurprisingly therefore the countries in which Internet penetration appears to be moderately higher are those with higher GDP per capita – where a significant number of people can absorb the high start up and usage costs. A major reason for the high cost of bandwidth is due to the limited transmission networks – both undersea cables and terrestrial backbone – as a result of policies of the protection of monopolies and their ineffective regulation.

This lack of backbone infrastructure and high cost of access to the Internet have been the major barriers to telecoms market growth. The landing of several undersea cables and a number of terrestrial fibre investment projects have led to a significant reduction in the costs of accessing the Internet. In some countries, the drop in wholesale prices has not, however, filtered to end-user prices. In South Africa, for example, existing customers have been provided with increased bandwidth for existing subscriber prices, which are high by international standards. Though welcomed by those already online, from a policy perspective this is unlikely to fuel the uptake of Internet and particularly broadband services which are so dismally behind other developing regions. Further, the demand-side challenges, such as digital literacy and the affordability of access devices like personal computers, is expected to remain a challenge.

While such outcomes reflect in many instances policy and regulatory failure, there have been some positive policy and regulatory developments on the continent with regard to the stimulation of investment through the opening of markets, the introduction of service-neutral licensing regimes, and the effective regulation of areas critical for ensuring successful entry into the market by new entrants and fair competition, in countries such as Ghana, Kenya, Nigeria and Tanzania.

There have been a number of call-termination-rate-determinations by regulators across the countries surveyed. The leverage of the resulting interconnection price reductions by new entrants in some countries, most recently Kenya, has been dramatic. In many other jurisdictions, despite considerable cuts in termination prices, these have not translated into lower retail prices. Instead most countries are characterised by high retail and wholesale prices, which continue to undermine policy objectives of universal access to affordable services and inhibit the potential of business process outsourcing opportunities and negatively affect the cost of business in most countries. In addition, the autonomy of regulatory bodies has been constrained by institutional arrangements and political processes negatively influencing regulatory outcomes.

Although growth in Africa's ICT sector has been driven by the private sector over the last decade and a half and by inward investments from high-income countries, with the onset of the global economic slow-down investment from high-income countries has declined. Instead there has been new multinational investment from emerging economies such as China and India. Investment in telecommunications access networks has been largely focused on wireless-based communications with limited investment in the fixed-line sector.

In order to address the limited investment in the much needed backbone infrastructure to provide seamless communications services, in many countries the state is playing an active role in attracting private investors through pubic-private partnerships, supplier sponsored concessions as in Uganda, supplier sponsored loans from the Chinese Import and Export Bank as in Ethiopia or investing in itself as in South Africa.

Telecommunications reform on the continent has been uneven as have been the results. Despite African countries committing to the alignment of their markets and regulatory institutions with international reform trends, this is only the case and partially so in many of the markets reviewed.

While several formally acceded over a decade ago to the World Trade Organisation General Agreement on Trade and Services Annex on telecommunication, there has often been greater rhetorical commitment to the process of separating policy, regulation and operations between the government, regulatory agency and the operator than there has been in practice.

Likewise, although 93% of African countries have established a regulator, the absence of political autonomy to regulate independently and capacity to regulate effectively is the main obstacle for a transparent, non-discriminatory and accountable regulation of the market. Instead, in many of the countries regulation of the telecommunications sector is marred by institutional failure, whether at the policy or regulatory level. Despite this obstacle, several of the countries reviewed, such as Ghana, Nigeria, and Tanzania to some degree, have managed to liberalise their markets by eliminating restrictions to market entry, or to regulate effectively enough to start reaping some of the benefits of competition.

As a result, the perception of the telecommunications regulatory environment in most countries reviewed tends to be negative, as indicated in the second part of this report. The uncertainty surrounding the regulatory environment consequently heightens perceptions of regulatory risk and impacts negatively on investment decisions.

In a converging and competitive infrastructure market, the emerging policy and regulatory challenges relate to the regulation of anti-competitive behaviour and to the establishment of licensing regimes that can accommodate next generation networks and services. In most jurisdictions these are primarily dealt with by the sector regulator, but in some countries, such as South Africa and Namibia, competition issues have to be addressed jointly with a competition authority.

With regard to emerging licensing regimes, although the African telecommunications market has not been fully liberalised and privatised in many instances, regulators are implementing unified licensing regimes in order to accommodate the convergence of technology. As competition intensifies and the uptake of wireless-based communications increases, the efficient management of spectrum represent a major challenge and priority for the regulator. The lack of access to spectrum limits the expansion activities of operators and deployment of new services such as wireless broadband. Newer, more efficient methods of spectrum allocation, such as auctions, are also receiving priority.

The opening up of markets regionally. most successfully in East Africa, has enabled business innovations, such as mobile banking which has proliferated there, providing some relief to the unbanked, but which will require the coordination of financial and telecommunication frameworks if further innovations are to be enabled. The progressive regulatory framework also enabled the global innovation of the regional roaming-free service pioneered by the mobile operator Zain, through treatment of it's contiguous national network as an integrated market. This strategy has been replicated by other operators across the African continent. However, national pricing still hampers the accessibility of mobile services. Tariffs are not only influenced by the number of players and level of competition, but regulatory aspects such as interconnection fees, taxes and levies increase the costs of telecommunication services. As a result, in terms of policy outcomes, large numbers of citizens across the continent still lack access to, or cannot afford, the kind of communication services that enable effective social and economic participation in a modern economy and society.

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Introduction

Despite the significant growth of mobile communication across the continent, which has brought communications services to millions of people for the first time, Africa as a region lags behind the rest of the world on a whole set of ICT indicators. With regards to Internet connectivity and particularly broadband, Africa's connectivity barely shows on global geographic indicator maps outside of South Africa and North Africa, with South Africa only just making a showing.

And from a policy perspective there is a paradox to increased connectivity. As more and more individuals connect to the range of enhanced information and communications services offered by converged broadband IP-based services, the digital divide between them and those who remain unconnected gets wider and wider. The competitiveness of countries in which those individuals who are connected and those in which they are not gets wider. Finally, the regions in which connected countries fall are better able to harness the benefits of regional integration and improve their competitiveness, increasing the gap between them and other less connected regions.

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This paper seeks to examine some of the factors that contribute to the different policy outcomes by comparing the sector performance in 17 African countries, their contribution to regional integration and global competitiveness and any policy, regulatory and institutional constraints on them doing so. Access and pricing are used as key policy outcomes to assess the effectiveness of policy and regulation in realising national and regional objectives of affordable access to communications services.

This review starts with an overview of the role of telecommunications in the macroeconomic environment of various African countries and highlights the role of ICTs in economic growth. When comparing the contribution of ICT to GDP across regions it is evident that generally ICT contributes a higher percentage to GDP in countries that have higher levels of GDP per capita. However, within the countries under review, countries such as Senegal, with a GDP per capita way below many of the other countries, has been able to leverage the contribution of ICTs to GDP, doubling its rates, from 5% to nearly 10% in three years, and outstripping the 17 other countries reviewed.

This is followed by a review of the policy and regulatory developments in Africa. These are highly uneven across the continent. While there have been considerable gains in some countries, such as those in East Africa, Namibia and Botswana, the move towards cost-based termination rates and to a lesser degree tariff regulation, the cost of communications nevertheless remains high. This has placed it out of reach of the general African population or resulted in only limited usage, undermining the policy objectives of affordable access and the construction of information societies and knowledge economies. In addition, sector-specific policies such as universal service levies and special taxes on ICT equipment and services tend to drive up the costs of services. Wholesales charges for leased lines and international bandwidth continue to be way above cost, as are interconnection rates in most countries, making them expensive input into businesses and contributing to high prices for end users.

The second section presents the results of the regulatory perception survey conducted in the 17 countries and against which the performance of the ICT sector in each country in the first part is considered. While there have been successes in the African telecommunications market, and some significant regulatory interventions in some countries, the general perception of the telecommunications policy and regulatory environment on the continent continues to be negative. In many cases, what is attributed to the failure of the regulatory actions, most fundamentally market entry, the main driver of competitive growth within the sector, are in fact policy constraints over which the regulator has no or little say. Likewise, the regulatory failure attributed the regulator often reflects the institutional arrangements and political constraints on its autonomy, for which it is also not responsible. Clearly, if Africa is to meet the central policy objective of providing accessible and affordable communications services to its citizens, governments are challenged to establish autonomous and publicly accountable regulatory regimes that are adequately resourced and skilled to regulate this dynamic sector effectively.

Sector Contribution to Economy

In recognition of the role ICT plays in stimulating economic growth and development, some African countries have adopted ICT-led development policies and are undergoing reforms in order to stimulate foreign investment in infrastructure. This has included the liberalisation of the telecommunications sector, which has opened up markets to increased competition, providing subscribers with access to a wider variety of services and contributing significantly to the national economy.[1]

Table 1: GDP per capita in US $ current

Country	2005	2006	2007	2008
Botswana	5716.3	5902.1	6522.3	6982.2
South Africa	5177.8	5438.3	5929.8	5678.0
Namibia	3614.5	3896.2	4231.1	4149.0
Tunisia	2888.4	3057.1	3424.8	3903.0
Nigeria	796.8	1018.0	1123.2	1369.7
Zambia	619.1	901.4	1001.5	1251.9
Cameroon	930.7	984.6	1108.6	1225.7
Cote d'Ivoire	850.3	882.8	983.7	1137.1
Senegal	770.1	808.9	951.8	1087.0
Kenya	523.2	611.9	718.4	783.0
Benin	545.0	582.5	660.8	771.2
Ghana	489.2	568.1	653.3	713.2
Burkina Faso	394.8	405.7	459.7	521.7
Tanzania	373.1	367.6	419.5	496.4
Rwanda	265.7	307.8	360.9	458.5
Uganda	313.6	334.6	400.9	452.5
Mozambique	315.8	332.3	367.8	439.9
Ethiopia	164.8	197.9	243.7	317.0

(Source: World Bank, Data database 2010)

The input cost of communications into other services and industries remains high in most countries however, and continues to be a barrier to broader industry investment and improved growth through the deployment of competitively priced communication services to improve the efficient supply of goods and services.

The arrival of several undersea projects like Seacom, which became operational in mid-2009, and Eassy in 2010, has significantly driven down bandwidth costs and improved the affordability of Internet services. The undersea cable projects have been accompanied by terrestrial national and cross-border infrastructure projects which have increased the impact of undersea cables on the pricing of Internet access. With the arrival of competition at the international level, international prices are becoming less expensive than national transmission tariffs. There are extensive plans by the New Partnership for African Development (NEPAD) to connect the interior of the continent to the cables. Mobile operators, unwilling to wait for these and other backbones to be built out, are playing a key role in the rollout of the fibre backbone infrastructure.

Despite Africa's GDP growth rate decreasing from 6.1% in 2007 to 5.7% in 2008 in line with the global economic slowdown, the ICT sector has continued to grow in line with global trends.[2]

Table 1 presents the GDP per capita across selected countries in Africa between 2005 and 2008. Table 3 below presents telecommunications revenue as a percentage of GDP. As demonstrated by economic research over the last two decades there appears to be a correlation between countries that have a higher per capita GDP and the countries in which telecommunications contributes a greater percentage to GDP, such as South Africa and Kenya (Roller and Waverman 2001).

African countries have started reducing terminations rates towards the cost of an efficient operator.

The 2010 Network Readiness Index (NRI) developed by the World Economic Forum measures the propensity for countries to exploit the opportunities offered by information and communications technology and the impact of ICT on the competitiveness of nations. The substantial growth that has nevertheless been seen in the ICT sector in Africa over the last decade has been driven largely by the private sector. Most African countries experienced an economic slow down in 2008, while

[1] Michael, E. B.(2008). The Role of Telecommunication Infrastructure in the Regional Economic Growth of Africa. Available online: http://mpra.ub.unimuenchen.de/12431/1/Telecommunication_in_Africa_Enowbi.pdf (Accessed May 2010).

[2] African Economic Outlook (2008). Available online: http://www.africaneconomicoutlook.org/en/outlook/macroeconomic-performances-in-africa (Accessed April 2010).

high-income countries like the United Kingdom and USA entered into a recessionary phase. As a result, foreign direct investment flows into the African telecommunications market from high-income countries declined in 2009. This was followed by an emergence and strengthening of new investors from more robust emerging economies, particularly India and China. For instance, in March 2010 Bharti-Airtel, an Indian company, acquired most of Zain Africa's operations for $10.7 billion, after failed merger talks in 2009 with MTN Africa's largest mobile operator.[3]

Table 2: Global Information Technology Report 2009–2010

	NRI Ranking	Environment	Readiness	Usage			
				Overall	Government	Business	Individual
Mauritius	53	42	45	75	77	66	70
South Africa	62	39	84	76	71	44	89
Senegal	75	82	47	83	64	64	96
Gambia	77	72	52	91	72	89	97
Botswana	86	65	86	97	90	97	95
Namibia	89	54	104	104	122	81	98
Kenya	90	91	81	92	74	69	111
Mali	96	101	83	106	73	108	122
Zambia	97	92	98	107	78	105	118
Ghana	98	89	87	120	119	123	113
Nigeria	99	97	94	102	113	83	105
Cote d'Ivoire	104	117	95	101	94	84	114
Lesotho	107	96	110	115	116	98	119
Burkina Faso	108	100	112	117	89	116	128
Benin	111	107	114	112	99	119	116
Uganda	115	102	124	113	103	109	117
Mozambique	116	114	115	118	96	110	126
Malawi	119	93	125	123	98	120	129
Tanzania	120	103	123	122	112	114	124
Madagascar	121	119	118	111	101	103	123
Ethiopia	122	127	96	128	108	127	132
Cameroon	128	126	127	116	111	107	115
Burundi	129	131	120	132	127	115	133
Zimbabwe	132	130	131	133	133	129	120
Chad	133	133	130	131	125	102	130

(Source: WEF - World Economic Forum 2010)

[3] World Economic Forum (2010). The Global Technology Report 2009–2010. Available online: http://www.weforum.org/documents/GITR10/index.html (Accessed May 2010) The NRI is comprised of three components, namely the environment for ICT offered by a given country or community, the readiness of the community's key stakeholders (individuals, businesses, and governments) to use ICT, and finally the usage of ICT amongst these stakeholders

ICT Policy & Regulatory Issues

Within the context of wider global governance frameworks of multilateral agencies such as the International Telecommunications Union (ITU), the World Trade Organisation (WTO) and the World Bank, and continental agencies such as the African Union (AU), most countries have embarked on reforming their ICT sector to align with global developments.

Regional Policy & Regulatory Co-ordination

Throughout Africa regional economic communities (REC) have increasingly focused on ICT policy and regulatory development as part of regional growth strategies. One of the main objectives of the regional bodies is to harmonise national ICT policy and legal frameworks within regional blocs. Regional harmonisation of ICT policy and regulation is recognised by regional communities and the international donor community as essential to regional economic integration and the integration of regional economies into the global economy. The underlying principles around which harmonisation is being pursued, are to bring about effective competition in the telecommunications market, to interconnect national networks for the development of a seamless African backbone infrastructure, and to promote regional and foreign direct investments. However, at present regional economic integration based on single markets with harmonised ICT policies has yet to be realised. In order to establish similar ICT policy goals, RECs created model policy guidelines as a starting point for regional harmonisation. Member states are expected use these guidelines to create their own national policy frameworks (Maitland and van Gorp, 2009).

Table 3: ICT Policy Initiatives

Organisation	Document	Year
African Union	Reference Framework for Harmonisation of Telecommunication and ICT policies and regulations	2008
East African Community, East African Regulatory, Postal and Telecommunications	Guidelines on Interconnection and access for telecommunications networks and services within the East African Community	2008
	A Study of Policy Harmonisation for East African Community	2009
	A study of regulatory harmonisation for EAC	2009
Economic Community of West African States	Supplementary Act A/SA.1/01/07 on the harmonisation of policies and regulatory framework for the ICT sector	2007
SADC	Protocol on Transport, Communications & Meteorology	1997
Economic Community of Central African States (ECCAS)	Recommendations to develop a regional framework for harmonising national policies and regulations	2009
Central African Economic and Monetary Community (CEMAC)	Six directives on ICT policy harmonisation, universal service, interconnection, tariffs and data protection	2008

RECs in Africa usually have a similar policymaking structure within which a sector-specific committee addresses issues related to ICTs, with the aim of implementing harmonised ICT policy and regulatory frameworks at a national level. Nonetheless, the main activities of regional associations of regulators are knowledge sharing and capacity building rather than legally binding harmonisation of policies. Furthermore, they have little or no implementation powers, which lie with national regulators. At a continental level, the African Union (AU) leads the process of harmonising the ICT policy and regulatory framework. The Reference Framework for Harmonisation of Telecommunication and ICT policies and regulations in Africa was adopted in May 2008, and endorsed by Summit in July of the same year. During the AU assembly in Addis Ababa on February 2010, the commitment to intensify activities to implement the Reference Framework was renewed once again. The Reference Framework is implemented through the ITU/EC project Harmonisation of the ICT Policies in Sub-Sahara Africa (HIPSSA).[4]

[4] During the period analysed (2009/2010) the ITU was involved in several projects with a total budget of USD 13 billion. Most of the technical assistance projects have a continental scope and are aimed at developing a harmonised ICT policy and regulatory framework. See the HIPSSA website, http://www.itu.int/ITU-D/projects/ITU_EC_ACP/hipssa/

At a regional level, both the Economic Community of West African States (ECOWAS) and the Southern African Development Community regions have already established legal and regulatory measures to harmonise their own ICT policy frameworks. In the ECOWAS, the ITU supported the REC to develop best practice guidelines with the aim of encouraging the establishment of an integrated ICT market in West Africa. In the SADC region the process of ICT policy harmonisation began with the SADC Protocol on Transport, Communications and Meteorology (1997). The document represents the first legal and policy framework for harmonising ICT policy at a regional level in Africa, but was not reviewed for over a decade. At the moment, with the support by the ITU, SADC is in the process of updating the current guidelines to align them to industry developments such as the convergence of broadcasting and telecommunications licensing models, taking into account technology-neutral licensing, Next Generation Networks (NGN), roaming, interconnection and tariffs. It also aims to create new additional guidelines related to cyber-security, a regional digital broadcasting migration plan, model dispute resolution, and competition policy.

Members of the East Africa Community (EAC) discussed plans for regional ICT policy harmonisation. However, in this region the process of ICT policy harmonisation has been retarded due to a sentiment among members that a harmonised ICT policy framework would have favoured Kenya, the leading country in the region. Since telecommunications markets in the EAC were amongst the earliest in Africa to open to competition, and since the EAC markets have been historically integrated, the REC is now in the process of determining if and how a single regulation policy can be applied uniformly.[5]

The Economic Community of Central African States (ECCAS) in June 2009 adopted recommendations to develop a regional framework for harmonising national policies and regulations. The ECCAS has a consultative body called the Telecommunication Regulators' Association for Central Africa (ARTAC). The association contributed to the ICT action plan for Central Africa. In addition, Ministers in charge of telecommunication and ICT from the Central African Economic and Monetary Community (CEMAC) adopted six directives on ICT policy harmonisation, universal service, interconnection, tariffs and data protection in November 2008. The EU/ITU HIPSSA project is currently conducting a benchmarking study to assess the degree to which these have been implemented.

Despite the trend in harmonising ICT policy and regulatory frameworks, the ITU recognises that "there is a high degree of heterogeneity among the regions in terms of advancement in the harmonisation process" (ITU, 2009). Waema (2005) has identified the challenges in ICT policy and regulatory harmonisation as the following:

- existence of multiple ICT policy and programme initiatives, some of which are often in competition with each other;
- very little ownership of regional ICT policy and regulatory initiatives from national African governments;
- regional organisations' and institutions' lack of institutional mechanisms to ensure compliance with model policies and frameworks as well as to monitor and evaluate the implementation. Member states belonging to the REC are sovereign states with no obligations to adopt and adjust national ICT policy and regulatory frameworks to the policy guidelines issued by regional bodies; and
- different stages of economic, political and social development make it difficult for member countries to have common priorities and therefore to adopt common models or frameworks.[6]

While considerable resources have been put into establishing and supporting structures for the regional integration of markets and harmonisation of ICT policies, there has been limited success in implementing harmonisation frameworks to date.

So while considerable resources have been put into establishing and supporting structures for the regional integration of markets and harmonisation of ICT policies, there has been limited success in implementing harmonisation frameworks to date.

Institutional Reforms

The last decade has also seen institutional rearrangements adjust within the ICT sector to conform to international reform trends. The ITU shows, for example, in the 2009 telecom development report that 93% of countries in Africa have established regulators. As a result, Africa is the continent with the highest number of regulators in the world. These reforms do not, however, appear to equate

[5] IT news Africa (2010). East African States discuss ICT policy harmonisation, available from http://www.itnewsafrica.com/?p=795.(Accessed May 2010).

[6] Waema, T. M. (2005). In Etta, F.E. and Elder, L. (eds.), A Brief History of the Development of ICT Policy in Kenya. At the Crossroads: ICT Policy Making in East Africa, (pp. 25-43). Nairobi, Kenya: East African Educational Publishers Ltd.

with regulatory effectiveness, with Africa lagging all other regions in global ICT indices. The ineffectiveness of many regulatory agencies across the continent relates to the absence of political autonomy to regulate independently. Further, in lamenting the poor levels of policy implementation by regulators on the continent, there is often a failure to acknowledge the underlying policy constraints on their effectiveness. For example, in Botswana the independent regulatory body is in charge of granting operators' licences autonomously and it finances its operational budget without ministerial approval with fees from the sector. Nonetheless, the Ministry has the authority to refuse or revoke an operator's licence as deemed necessary. In order to guarantee the separation of functions, traditionally five separate entities have been created under the ministry in Kenya: the state-owned fixed-line operator; the regulator; the postal corporation; the National Communications Secretariat; and the appeal tribunal for arbitration. On the other hand, in Ghana, despite a new ICT law being promulgated in 2008 with the aim, among others, of preventing political interference in the regulatory body, the new legal framework has not advanced much. And in many instances, like most West African countries reviewed, despite formal separations of powers, political pressure is brought to bear on decision-making. In extreme cases like Ethiopia, the regulator's role, which remains within the ministry's, is limited to monitoring the behaviour of a single monopoly incumbent. Several countries, in acknowledgement of the convergence of broadcasting and telecommunications, have merged their regulatory authorities in a single communications sector regulator. Countries that have done so, in various permutations, include Botswana, Ghana, Namibia[7], South Africa, and Tanzania.

Liberalisation & Competition

The problem with international regulatory blueprints is that they are often drawn from markets far more mature and competitive than many of those in Africa.

Telecommunications in Africa has become far more dynamic with liberalisation, with the exception of Ethiopia which still maintains a government-owned integrated monopoly for mobile, broadband and fixed-line services. In Ghana, for example, further operators' licences have been granted, with five now operating, causing mobile prices to plummet over the last two years. Policy and legal frameworks support the development of a competitive ICT market in the country based on principles of open markets and fair competition. Moreover, the government has reduced its direct involvement in the ICT market. With increased competition in across the continent there is a need to control abuse of dominance, anti-competitive agreements and anti-competitive mergers and acquisitions. While a sector-specific regulatory authority is in charge of ex-ante economic and technical sector regulation, a competition authority in general has an ex-post regulatory role, other than mergers and acquisitions, and a broader mandate over competition enforcement. Often, however, roles and responsibilities of the two authorities overlap, especially in the exercise of economic regulation. Since economic regulation, such as granting licences and determining prices might have a direct impact on competition, in the absence of clearly defined jurisdictions and mechanisms for co-jurisdiction, the entities can fail the sector rather than make it more effective. The United Nations Conference on Trade and Development (UNCTAD) identifies the following scenarios that have been implemented by several jurisdictions to resolve conflicting mandates:

- Merge both technical and economic regulation in a sector-specific regulator and leave competition enforcement within the competition authority;
- Merge both technical and economic regulation in a sector-specific regulator that can enforce competition;
- Merge both technical and economic regulation in a sector-specific regulator and give it competition law enforcement functions which have to be performed in co-ordination with the competition authority;
- Separate technical regulation as an independent function for the sector regulator and leave economic regulation within the competition authority;
- Gather all aspects of regulation and competition law under the control of the competition authority.[8]

The problem with international regulatory blueprints is that they are often drawn from markets far more mature and competitive than many of those in Africa. Several of the anti-competitive drivers are a result of policy constraints or protectionism that enable and even incentivise an incumbent or

[7] The Communications Act No 8 of 2009 that establishes a converged regulator had not commenced in October 2010.

[8] CUTS International (2008). Competition authorities and sector regulators: what is the best operational framework? Available online:http://www.cuts-international.org/pdf/Viewpointpaper-CompAuthoritiesSecRegulators.pdf (Accessed September 2010)

dominant player to behave uncompetitively. The reality is that sector regulators are likely to be required to enable fair competition for a long time, while competition authorities often do not have the necessary sector expertise to deal with technical issues in infrastructure industries. Of course, sector regulators have also often lacked the skills to regulate effectively, which is why industry has lobbied for competition authorities to regulate across the board. Lack of co-ordination between the two can encourage 'forum shopping', whereby complainants tote their disputes from one forum to another to see where they might get the most sympathetic hearing.

The reality is that sector regulators are likely to be required to enable fair competition for a long time, while competition authorities often do not have the necessary sector expertise to deal with technical issues in infrastructure industries.

Kenya and Zambia have merged both technical and economic regulation in a sector-specific regulator with competition law enforcement reflecting the second scenario identified by UNCTAD and resulting in a regulatory authority with substantial power not only in technical and economic regulation but also in competition issues. South Africa and Namibia, on the other hand, have adopted arrangements for the sector that appear to emulate the third scenario identified. In these countries competition authorities have co-jurisdictions with the regulator, and the competition authorities are specialised in mergers and acquisitions and in anti-competitive practice. In Uganda, where the sector has been extensively liberalised, and despite the growth of competition in the sector, the dominance of certain players continues to prompt the question of whether existing competition provisions exercised by the sector regulator are sufficient to guarantee fair competition, or whether a dedicated authority based on competition law is necessary.

Towards a Unified-Licensing Regime

Many African countries are undergoing complex restructuring of ICT policy and regulatory frameworks in order to liberalise and privatise the sector. Countries like South Africa, Tanzania, Namibia and Uganda created converged regulators, typically with responsibility for regulating the broadcasting, telecommunications and postal sectors.

Tanzania is still in the process of integrating legal frameworks related to telecommunications, broadcasting and postal services, despite the ratification of an Act specifically developed to address convergence issues. South Africa, Tanzania, Kenya, Uganda, Ghana and Botswana have already implemented a technology-neutral horizontal licensing framework, but the scope of restructuring the telecommunications market is uneven throughout the continent. In these countries, the migration from a vertical to horizontal licensing regime is considered a key strategy to address the technological, market and service convergence. In these markets, the unified licensing framework is considered as an opportunity to increase competition. However, the capacity to implement these changes remains a major challenge. In South Africa, after considerable delays by the regulator in implementing the onerous transition regime imposed on it by the law in 2006, new entrants finally took it and the Minister to court in 2009 and the matter was settled in their favour.[9] In Tanzania, the converged licensing framework is considered the central strategy around which the market has been fully liberalised. The converged licensing framework simplified existing licensing procedures to ease market entry. It also ensures regulatory flexibility to address market and technological developments; and establishes efficient utilisation of network resources, so that networks may be used to provide a broad range of ICT services. In Kenya the regulator replaced the licensing system based on a bidding process with an open market-based licensing. The regulator abolished the beauty contest in preference of implementing a more accessible licensing framework, on a first come first served basis. A unified technology and service-neutral licensing framework has been effective from late 2008. Progressively, it permits any form of telecommunications infrastructure to be used to provide any type of communications service. The country has introduced this new regime gradually, and has established a transition period during which it will issue three types of technology-neutral licences.

In Uganda the separation of the licensing of infrastructure from the service provision increased competition in the market. The technology-neutral licensing regime provides the licensee with the opportunity to select the technology of their choice to deliver ICT services. With regard to the services segment of the ICT market, the licensing framework is based on two types of licences: the first allows operators to deliver voice and data services; the second licence is a capacity resale licence for resell operations using the capacity of other operators.

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[9] Altech brought a court action against ICASA and the Minister of Communications after the decision by ICASA to limit the number of converted ECNS licences on on the directive of the Ministry. It also sought relief from a contested prohibition on VANS being able to provide their own network facilities without having to obtain these from incumbent licensed telecom network operators such as Telkom or Neotel. The court declared that the prohibition on self-provisioning is in direct conflict with the enabling legislation and ordered that all VANS operators licensed before the start of the conversion process be allowed to self-provide, in accordance with the initial policy direction and the initial interpretation offered by ICASA in 2004.

Table 4: Converged Regulator

	Converged Regulator	Service & Technological Neutral Licences
Benin	No regulator	
Botswana	Yes	Yes
Burkina Faso		
Cameroon	Not converged	No
Côte d'Ivoire		
Ethiopia	No regulator	No
Ghana	Yes	No
Kenya	Yes	Technologically neutral
Mozambique	Not converged	Technologically neutral
Namibia	Yes	Yes
Nigeria	Yes	Yes
Rwanda	No	No
Senegal	Yes	Yes
South Africa	Yes	Yes
Tanzania	Yes	Technologically neutral
Tunisia	Not converged	Technologically neutral
Uganda	Not converged	Technologically neutral
Zambia	Yes	Yes

In Ghana the licensing regime supports widespread market entry and the framework partially supports service neutrality. The licences of the telephone companies allow them to provide services which are related to their core activities, and they only need to inform the regulator about their intention. A typical example of service neutrality is the provision of data services by the mobile telephone companies in the country. In 2006 Botswana, with the purpose of enabling competition among operators, reviewed the licensing structure towards a service neutral licence to enable competition and innovation in the market, and Botswana has continued to shine with regard to some key indicators as a result.

Privatisation

It is evident that the privatisation process in the selected countries (table 5) has been slow. Instead the state continues to maintain dominance over fixed-line incumbent operators and often creating a structural conflict of interest in the institutional arrangements in terms of their broader policy mandate for the sector, and indeed their competitors.

Table 5: Ownership of incumbent fixed-line operator

Country	Name	Government Ownership %	Source
Benin	Benin Telecoms		
Botswana	BTC	100%	http://www.btc.bw/
Burkina Faso	Onatel	100%	http://www.mbendi.com/indy/cotl/tlcm/af/bf/p0005.htm
Cameroon	Camtel	100%	http://www.mbendi.com/indy/cotl/tlcm/af/ca/p0005.htm
Côte d'Ivoire	Côte d'Ivoire Telecom	49%	ttp://www.mbendi.com/orgs/cht6.htm
Ethiopia	ETC	100%	http://www.ethionet.et/aboutus/companyprofile.html
Ghana	Vodafone Ghana (Ghana Telecom)	30%	http://www.vodafone.com.gh/About-Us/Vodafone-Ghana.aspx
Kenya	Telkom Kenya	49%	http://allafrica.com/stories/200801080875.htm
Mozambique	TDM	100%	http://www.mbendi.com/indy/cotl/tlcm/af/mz/p0005.htm
Namibia	Telecom Namibia	100%	http://www.reuters.com/article/idUSLDE62I0WS20100319
Nigeria	Nitel (Transcorp)	25%	But 75% reclaimed in 2006 after failure of equity partners to meet obligations and currently bid by Omen International Consortium (Cellular News 2010)
Rwanda	Rwanda Tel		http://www.rwandatel.rw/?-History-
Senegal	Orange Senegal	17,28%	
South Africa	Telkom South Africa	39,80%	https://secure1.telkom.co.za/ir/sustainability/shareholding/shareholding.jsp
Tanzania	TTCL	36%	http://www.ttcl.co.tz/about_history.asp
Tunisia	Tunisie Télécom	100%	http://www.zawya.com/cm/profile.cfm/cid337471
Uganda	Uganda Telecom	31%	http://www.utl.co.ug/utl.php?i=75
Zambia	Yes	Yes	

Spectrum Management

Efficient spectrum allocation is one of the primary enablers for rapid wireless deployment of services. With the advent of wireless broadband and the likelihood of dependence on wireless in the large-scale absence of fixed infrastructure, making available spectrum at fair value has become a key policy and regulatory issue. Open access regimes, which enable wireless service access to backbone and other critical facilities, are vital to optimising available technologies to extend communications services.

In Ethiopia, where the market continues to operate under a monopoly regime, the ministry has not established a spectrum policy or guideline for the usage of the spectrum commons. As a result there is little competition for spectrum.

In other countries, where the market is more liberalised, such as in Uganda, spectrum availability represents the main limitation to market entry. As a result many of the 23 infrastructure licences and 30 service licences cannot operate effectively. Ineffective management of spectrum has therefore compromised the benefits of competition.

A similar situation can be found also in Cote d'Ivoire. Warid obtained a licence in 2007, but has not been able to launch services commercially as it has not obtained the necessary wireless frequencies.

On the other hand, in Botswana the regulator installed a mobile monitoring centre with the aim of monitoring spectrum allocation and illegal radio users.

Another concern is the hoarding of spectrum, when an operator obtains a licence and is awarded spectrum, but does not launch commercial operations. For instance, in South Africa the demand for WiMax spectrum is growing, but a large amount of spectrum has already been allocated to the state-owned broadcast signal distributor Sentech. Historically Sentech has been assigned this spectrum for broadcasting purposes, but it has been argued that in the dynamic convergence environment this has resulted in an under-utilisation of frequencies that could more optimally be used by other operators. As a result, spectrum allocation is in a stalemate. Despite the conclusion of public hearings and the publication of a spectrum findings paper in June 2008, there has not been much progress. The Department of Communications announced in 2009 its intention to conduct a spectrum audit, but they have anticipated that this will take two years.

In light of the challenges related to the allocation of spectrum, some regulators have opted to use an auction process with the aim of providing equal access to spectrum. There have been concerns that the bidder with more financial resources often wins the bid and therefore smaller operators are left out. There are however mechanisms, such as considering other non-financial factors, or not selecting the highest bid, but instead the second or third, to overcome this and avoid the overvaluing of spectrum in bidding wars and the resultant high prices for consumers. Nigeria is one of the countries that has been proactive in this are. In 2009, however, a number of legal and political issues arose over the auctioning process of the 2.3 GHz band in Nigeria. In October 2009, the Nigerian federal court ordered the Nigerian Communication Commission to halt the process to re-auction the 2.3 GHz band.

Interconnection

Call termination is a natural monopoly element of the network. While call origination can be made competitive in numerous ways, there is simply no alternative to terminating a call on the network of the operator who owns the number a caller is trying to reach. The basis of regulation of this monopoly service is that termination rates should be based on the costs of an efficient operator so that interconnecting operators, and ultimately end users, would not have to bear the costs of an inefficient operator. There is overwhelming international evidence that cost-based termination rates encourage competition and more affordable pricing.

There is overwhelming international evidence that cost-based termination rates encourage competition and more affordable pricing.

In support of high termination rates, dominant mobile operators have argued that lowering termination rates will lead to increases in access and usage prices, leading to fewer people being able to afford communication services, and resultant lower profits that will limit operators' capacity to invest. Evidence suggests the opposite has been the case. Lowering termination rates towards the cost of an efficient operator leads to increased competition, lower retail prices and higher mobile subscriber numbers (see Table 6). All of the 21 European countries in Table 4 have seen MTR cuts between 2006 and 2010. None has seen an increase in prices between 2006 and 2008 (more recent data is not yet available from the OECD) and only one experienced a drop in mobile tele-density. Luxembourg's mobile tele-density dropped from 152 to 146 mobile

subscribers per 100 inhabitants between 2006 and 2008. The drop could be due to a reduction in duplicated SIM cards, with lower off-net prices due to lower MTRs reducing the need to have two SIM cards. It is unlikely to be the result of increased access and usage prices considering that prices came down in the same period.

Table 6: Changes in mobile low-usage basket prices compared to changes in MTR

	Mobile Termination Rates in Euro Cents (ERG/BEREC)			OECD Mobile Low-usage Basket US$ PPP (OECD)			Mobile Subscribers in Million (ITU)		
	2006	2010 January	Decrease in %	2006	2008	Decrease in %	2006	2009	Increase in %
Austria	11,21	3,50	**69%**	193,43	148,26	**23%**	19,76	24,22	**23%**
Belgium	13,97	8,84	**37%**	175,51	146,92	**16%**	9,85	12,42	**26%**
Denmark	11,34	7,37	**35%**	68,82	50,31	**27%**	5,83	6,86	**18%**
Finland	7,90	4,90	**38%**	99,89	60,31	**40%**	5,67	7,70	**36%**
France	9,80	4,76	**51%**	239,68	216,49	**10%**	51,66	57,97	**12%**
Germany	11,39	6,77	**41%**	123,55	104,55	**15%**	85,65	105,52	**23%**
Greece	12,48	6,24	**50%**	302,47	202,46	**33%**	10,98	13,30	**21%**
Hungary	10,71	5,22	**51%**	230,48	217,08	**6%**	9,97	11,79	**18%**
Iceland	12,12	4,45	**63%**	142,61	117,61	**18%**	0,30	0,35	**17%**
Ireland	10,54	9,68	**8%**	202,95	149,95	**26%**	4,69	4,87	**4%**
Italy	12,20	8,24	**32%**	233,39	195,23	**16%**	80,42	90,61	**13%**
Luxembourg	14,00	8,98	**36%**	112,84	107,59	**5%**	0,71	0,72	**1%**
Netherlands	11,40	7,30	**36%**	119,63	105,02	**12%**	17,30	21,18	**22%**
Norway	8,85	7,05	**20%**	111,2	86,72	**22%**	4,87	5,34	**10%**
Poland	13,52	4,32	**68%**	209,79	147,94	**29%**	36,75	44,55	**21%**
Portugal	11,71	6,50	**44%**	178,44	153,8	**14%**	12,23	15,18	**24%**
Slovak Republic	10,46	7,28	**30%**	255,4	241,62	**5%**	4,89	5,50	**12%**
Spain	11,31	6,20	**45%**	258,02	250,8	**3%**	45,70	50,99	**12%**
Sweden	7,83	3,09	**61%**	87,92	77,69	**12%**	9,61	11,43	**19%**
Switzerland	15,15	10,70	**29%**	145,11	111,03	**23%**	7,44	9,26	**24%**
UK	8,70	5,52	**37%**	170,53	160,4	**6%**	70,08	80,38	**15%**
Average	**11,27**	**6,52**	42%	**174,36**	**145,32**	17%	**494,36**	**580,14**	17%

(Source: OECD 2007; OECD 2009; ERG 2006; ERG 2010, ITU2010)

Figures 1 and 2 display OECD termination rates for 2009 against cost of usage (OECD usage baskets) and minutes of use. The general trend is that countries with lower termination rates in a Calling Party Pays environment have lower usage cost and higher minutes of use.

African countries have embarked on regulatory interventions that reduce mobile termination rates towards the cost of an efficient operators. While Tanzania, Uganda, Kenya and Zambia conducted cost studies, Namibia used a benchmarking approach. Table 5 displays the up-to-date mobile termination rates in currency specified in the regulation and in US cents. Figure 3 compares mobile termination rates in US cents graphically. Plotting these termination rates against the cost of OECD low user baskets for mobile telecommunication (OECD, 2006) for the cheapest product available confirms the link between high termination rates and high prices for the African countries covered (see Figure 4).

The termination rate reductions in Kenya and in Namibia resulted in lower retail prices. The case of Namibia has demonstrated how benchmarking can be used to increase fairness in competition among operators, and that regulatory interventions can lead to cheaper prices, more subscribers and more investment. It also showed how a regulatory bottleneck can be overcome relatively quickly and inexpensively by using alternative regulatory strategies such as benchmarking, and by placing the burden of contestation onto operators that have the relevant data, skills and resources to contest the benchmarks if they feel they are unjustified (Stork, 2010).

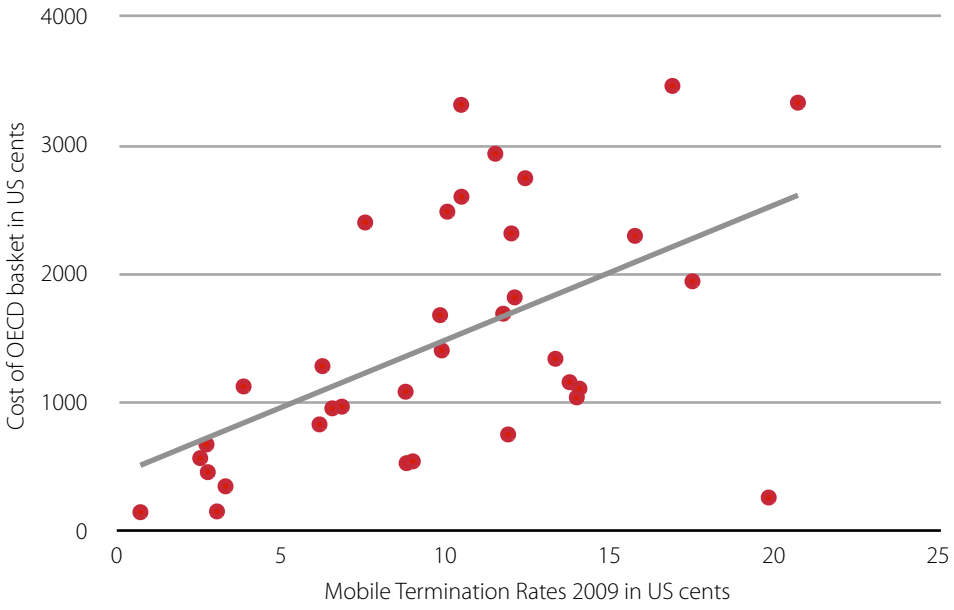


Figure 1: Mobile termination rates versus cost of usage (source TMG2010)

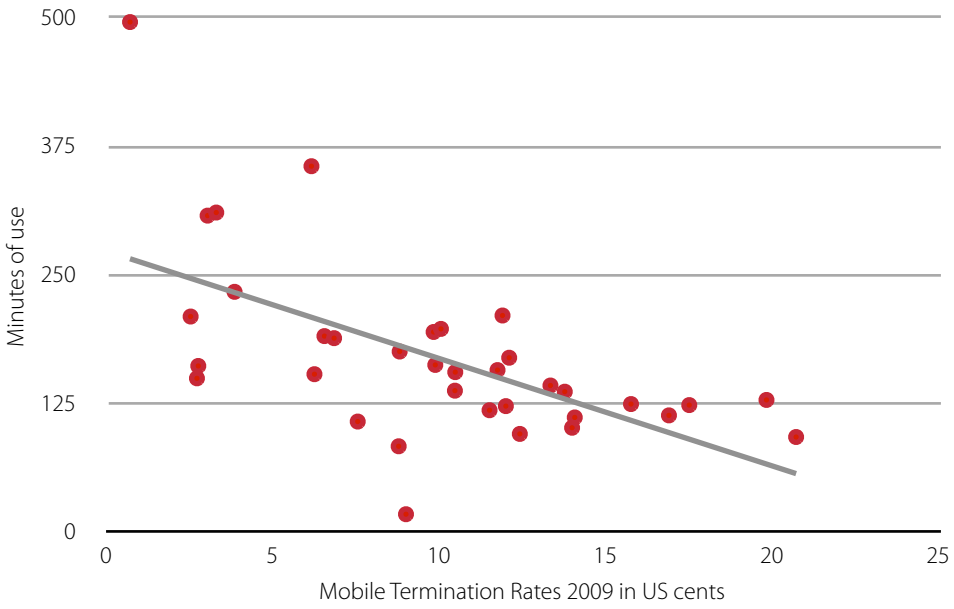


Figure 2: Mobile termination rates versus minutes of use (source TMG2010)

The termination rate ruling by the CCK of August 2010 and the immediate slashing of retail prices by smaller mobile operators have shown how important cost-based termination rates are for fair competition. The CCK ruling has been groundbreaking in several ways. The determination is based on a pure LRIC cost study in line with international best practice and the recommendations of the European Commission to European regulators from May 2009. Kenya is the first country to apply the EU recommendations of 2009 by enforcing cost-based termination rate caps based on pure LRIC. Kenya therefore has one of the lowest mobile termination rates in Africa at 2.21 Ksh (2.7 US cents). Another groundbreaking aspect is the retail price cap for off-net calls of dominant operators by requiring them to be less than or equal to the on-net price. This prevents dominant operators creating club effects by setting off-net prices high. The determination is also groundbreaking because the CCK announced that it will monitor market developments in SMS termination, broadband interconnection, money transfer interconnection and infrastructure sharing, and that it will intervene if commercial negotiations will not lead to competitive outcomes. This creates regulatory transparency and certainty, two very desirable regulatory attributes.

Table 7: Mobile termination rates in RIA Countries

	Mobile termination rate				Comments	Source
	Regulation	Currency	US $ FX*	US cents		
Benin	62	CFA	504,1	12,3		TMG 2010
Botswana	0,45	Pula	6,92	6,5	glide path to 0.3 Pula by 2014	BTA 2011
Burkina Faso	50	CFA	504,1	9,9		TMG 2010
Cameroon	0,16	US$	1	16,0		TMG 2010
Côte d'Ivoire	45	CFA	504,1	8,9		ATCI (2009)
Ghana	0,05	Cedi	1,45	3,4		NCA (YEAR)
Kenya	2,21	Kenya Shilling	82,25	2,7		CCK (2010)
Mozambique	2,59	MT	33,2	7,8	Symmetric MTR since 2010	INCM (Year)
Mauritius	0,9	Rupee	31,86	2,8		ICTA (2008)
Namibia	0,3	NAD	7,34	4,1		NCC (2009a)
Nigeria	8,2	NGA	152,80	5,4	for existing operators	NCC (2009b)
Rwanda	0,07	US$	1	7,0		TMG 2010
Senegal	11,35	CFA	504,1	2,3		TMG 2010
South Africa	0,83	ZAR	7,34	11,3	Peak ZAR 0.89, Off peak ZAR 0.77	ICASA (2010)
Tanzania	7,49	US cents	1	7,5	Further drop to 7.16 US cents 1 January 2012	TRCA 2007
Tunisia	0,085	Tunisian Dinar (TND)	1,44	5,9		TMG 2010
Uganda	181	Uganda Shilling	2200	8,2	Warid as a different MTR	UCC (Year)
Zambia	0,059	US$	1	5,9	further reductions to 5 US cents by 1 January 2012	ZICTA (2010)
Ethiopia	na		14,62	na	only 1 mobile operator	TMG 2010

** Average interbank rate for 2010 (source www.Oanda.com)*

The impact on retail prices has been dramatic. Zain, which was acquired by Bharti Airtel Limited ("Bharti") in June 2010, took the lead by announcing a reduction in their prices of over 50%. Calls from Zain are now at Ksh3 to any network and Ksh1 for an SMS. It is not surprising that Bharti took the lead given its reputation in India, where it proved its dominance in the market by launching a price war in 2009 with its main rival Reliance Communications.

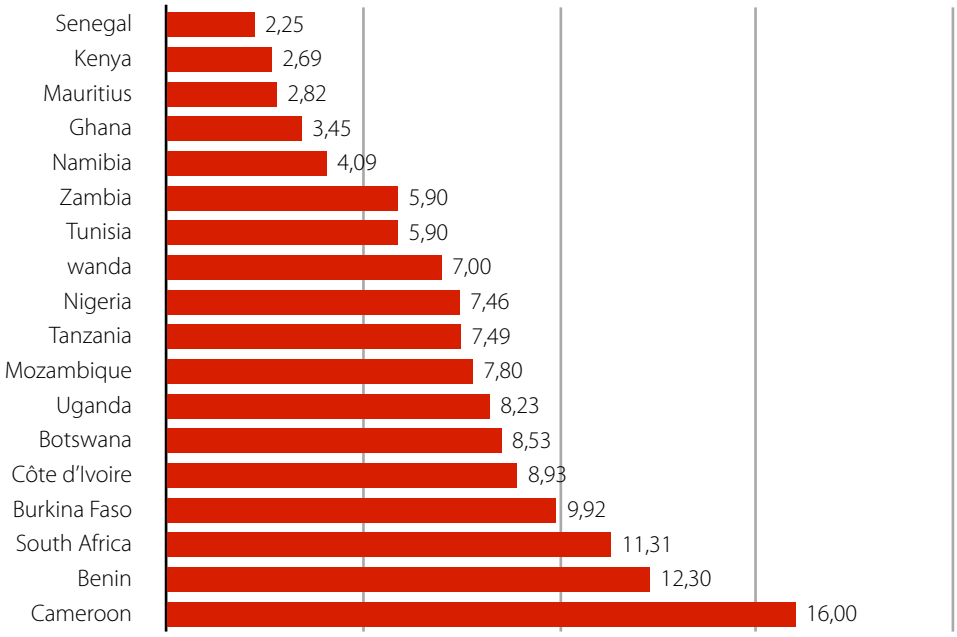


Figure 3: Mobile termination rates in US cents (FX = average 2010)

Orange also cut its rates, remaining the cheapest prepaid operator in Kenya (See Table 6). In reaction to this, Safaricom started a prepaid promotion with rates between Ksh2 and Ksh5 a minute. The prices, which were only effective until the end of September 2010, are based on different recharge amounts. Figure 4 displays the cost of the cheapest prepaid product for each operator for low, medium and high OECD usage baskets according to the 2006 definition (OECD, 2006). The table only displays long-term rates, not promotions. It is clear that Safaricom's prepaid prices have become unsustainable. It will need to make permanent changes to its tariff structure or surrender market share to its competitors, or else face a loss of subscribers and market share.

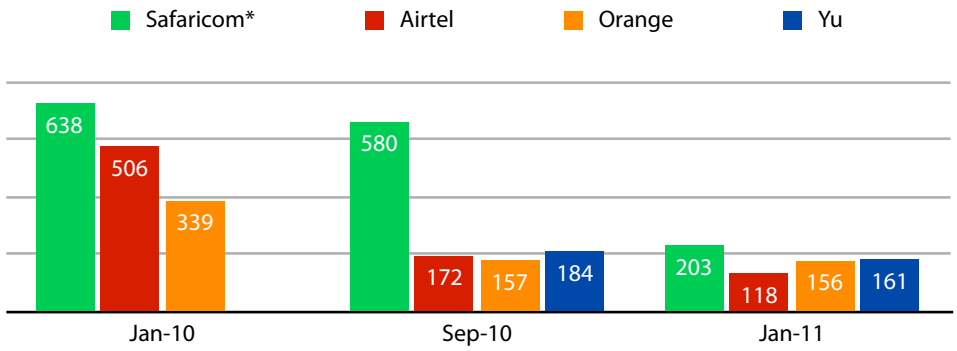


Figure 4: Monthly cost of OECD Low User bundle in Kes (2006 Definition)

The examples of Namibia and Kenya demonstrate that cost-based termination rates are a pre-condition for fair competition and lead to lower retail prices. It can be expected that countries will follow the example set and that termination rates across the continent will approach the cost of efficient termination over the next couple of years.

The End of Roaming

For over a decade European regulators have struggled to regulate roaming tariffs. This resulted in a challenged European Union order in 2008 regulating roaming tariffs for European operators. Progressive African regulators, on the other hand, had started to speak about the need to regulate exorbitant roaming charges from their jurisdictions. The rapid end to roaming charges in East Africa challenged the conventional wisdom that the only way to reduce roaming charges was through complex and resource intensive regulation, monitoring and enforcement. This elimination of roaming charges was achieved through Zain– a regional African operators strategy called "One Network".

While Europe is struggling with the regulation of high roaming charges, in East Africa high tariffs and roaming charges are being far more effectively addressed through competition in marginal markets.

While policy makers and regulators elsewhere in Africa emulate European "best practice" regulation, despite the difficulties mature and resourced regulators in the European Union face in instituting legally binding maximum tariffs for roaming, in East Africa operators have dropped roaming charges from competitive business models. The creation of an enabling policy and regulatory environment allowed operators to integrate historically separate national networks into cross-border operations, undermining roaming markets in the region and ending roaming charges in East Africa forever. While Europe is struggling with the regulation of high roaming charges, in East Africa high tariffs and roaming charges were being far more effectively addressed through competition in marginal markets.[10]

With the decision in September 2006 by Celtel, now Zain, to exploit its only competitive advantage – licences in Kenya, Tanzania and Uganda – and crack open the regional market by dropping all roaming charges between its networks, it set in motion a competitive struggle for roaming customers from which there was no return. Zain – itself a marginal operator in all three original East African community jurisdictions prior to its disruption of the market – achieved, with regard to roaming, in weeks what most African regulators had not even contemplated and European regulators had struggled with for nearly a decade.[11]

Mobile phone users in this region are largely pre-paid and adept at using multiple SIM cards. There was little stopping them from moving en masse to a network that offered them their home package rates as they moved across East Africa's porous borders. With the high price of communications in East Africa and the premium charges placed on international mobile roaming, the effect of this move was to compel other regional operators to follow suit, and further, to institute various other pricing strategies in an attempt to retain or recover their dominant positions. As a result, not only did roaming charges disappear across all networks, but the prices of various other mobile services also fell as subscriber numbers soared.[12]

Shortly after the launch of One Network in September 2006, the competing networks in the three East African countries of Kenya, Tanzania and Uganda responded by creating their own competing seamless service. The service, branded Kama Kawaida (as usual), brought together partner networks in four countries, namely Safaricom in Kenya, MTN and UTL in Uganda, Vodacom in Tanzania and MTN Rwanda.[13]

In Kenya, for example, Zain aimed to explore ways of increasing its market share vis-à-vis Safaricom, the dominant market player. Exploiting its contiguous network to increase its market share was an opportunity that it exploited. Zain's customer numbers grew, but not as fast as those of Safaricom, which had responded swiftly to counter Zain's competitive advantage. By December 2008, Zain customers had increased to three million and a market share of 17%. Thus One Network helped retain customers in its network, especially in the face of two new players that entered the market in the last quarter of 2008, namely Orange and Econet Wireless.[14]

Mobile Banking & Transfer Systems

The difference between mobile banking and mobile payment systems is that mobile banking requires a bank account and a mobile payment system does not.

Mobile banking services are offered by a bank as an additional channel to do banking. They make use of a mobile telecommunications network as a platform to perform traditional banking, such as performing balance checks, transferring money between accounts and making payments.

Mobile transfers services are provided by a number of mobile operators across the continent. The key advantage of the service is that it does not require a bank account neither for the sender nor for the receiver. The mobile transfer services are targeted at the unbanked population and only offer one out of many banking services, transfer of money.

Mobile transfer and payments services were pioneered by Safaricom, Kenya's dominant mobile operator, in 2007. The service is popularly known as M-Pesa. Within three months of the launch of services, M-Pesa had 400 agents, compared to 450 bank branches and 600 ATMs through

[10] Gillwald, A. and Mureithi M. (2010) and Regulatory Intervention or Disruptive Competition? Lessons from East Africa on the End of International Mobile Roaming Charges, RIA, Towards Evidence Based Policy Vol.2 No. 3
[11] Ibidem
[12] Ibidem
[13] Ibidem
[14] Ibidem

the country[15]. Following the success of M-Pesa, similar systems have been developed across the continent. In the East African region, mobile transfer services are offered by MTN, Zain, Vodacom Tanzania, and Rwandatel in East Africa. West African mobile operators are increasingly providing mobile payment systems to address the low-end-customer segment in the region. The majority of the population in West Africa live in rural areas and do not have access to banking facilities. Mobile transfer services are being deployed as part of the operators' customer acquisition strategy and to facilitate growth. For example, in 2008 Orange in the Ivory Coast launched a service called Orange Money. It allows customers access to an entire range of services making it possible to carry out day-to-day banking operations and transactions such as depositing and withdrawing money from the Orange Money account up to an amount of CFAF 100,000 (approximately €150), the transfer of money from one person to another, and the purchase of airtime credit up to CFAF 10,000, 24 hours a day. In addition to this, customers are able to pay their utility bills through their mobile phones.

In many regards, the telecommunication and financial sectors are similar. Both are crucial for economic and social development, and both have only a few players (oligopolies) and need hence to be regulated in the public interest. In the future, not only will banks and mobile operators be required to co-operate more closely, but the different sector regulators will have to do that as well.

Mobile payment systems could be operator or bank specific, or they could be completely independent, operating on servers that communicate with banks, individuals and companies across operator networks. Financial service provision requires a banking licence. Operators may apply for a banking licence or co-operate with a bank. Banks could also become virtual network operators, mobile operators without their own infrastructure that roam on the networks of other operators. From an economic or developmental perspective, the ideal would be a mobile payment system that is independent of banks and operators and allows transfers and interactions between any bank and any operator. The formal financial system, with its automatic clearing bureau, is such a system, but it tends to be very expensive. An alternative would be a system similar to the peering system used for Internet traffic, where operations carry traffic for each other without charge. An operator should have no objection to receiving money from another operator, which is different from terminating a call for another operator. A mobile payment system would need to replicate this formal system but with a zero or extremely low transaction cost for the actual users. The current value being generated by both mobile operators and banks in Africa makes a partnership for such a system between banks and operators unlikely. A third party, who is able to understand the dynamics of a volume-based, small margin business, is more likely to succeed.

Just as convergence forced the integration of broadcasting and telecommunications, so mobile banking is forcing the convergence of the financial and telecommunications sectors. Unfortunately, the convergence of two such heavily regulated industries means that this potential is unlikely to be met unless policy-makers lay the ground rules for innovation. Recommendations could include encouraging the development of industry standards for mobile banking security based upon open access principles and changing regulatory systems to allow mobile operators to become banks, or banks to operate Mobile Virtual Network Operators (MVNOs).

Policy-makers need to make some strategic decisions about how best to leverage the opportunity that mobile banking represents.

Policy-makers need to make some strategic decisions about how best to leverage the opportunity that mobile banking represents. In order to allow innovation, regulators, on the other hand, quickly have to learn to grapple responsively and flexibly with new issues that appear to extend beyond their domains of expertise. From the solutions that emerge, the market can help decide what is most appropriate given the African context.

[15] African Economic Outlook (2009). MPesa leads mobile payments in Kenya.Available online: http://www.africaneconomicoutlook.org/en/in-depth/innovation-and-ict-in-africa-2009/pro-development-innovative-applications/box-22-m-pesa-leads-mobile-payments-in-kenya/. (Accessed September 2010).

Policy Outcome: Access

Policy outcomes are captured in this section through their impact on access to ICTs and cost of usage. The section will proceed by analysing the policy outcomes in the fixed, mobile and Internet segments. A pricing analysis of the total cost of ownership in the mobile segment and prepaid mobile pricing is provided. The section ends with an assessment of leased line pricing in selected countries.

Fixed-line

In most African countries fixed-line services have been very limited, unreliable and of poor quality. Consequently, Africa has the lowest fixed-line penetration rates in the world. The rapid increase in mobile subscribers is due to the ability of mobile operators to meet the pent up demand for communications.

Table 8: Number of fixed lines as a percentage of the population

	2007	2008	2009
Tunisia	12,65	12,18	12,45
South Africa	9,22	8,91	8,62
Botswana	7,24	7,41	7,4
Namibia	6,61	6,57	6,54
Senegal	2,26	1,95	2,22
Kenya	1,23	1,67	1,67
Cameroon	1,01	1,34	1,66
Benin	1,32	1,19	1,42
Cote d'Ivoire	1,23	1,73	1,34
Ghana	1,65	0,62	1,12
Ethiopia	1,12	1,11	1,1
Burkina Faso	0,83	0,95	1,06
Nigeria	1,07	0,86	0,92
Uganda	0,54	0,53	0,71
Zambia	0,75	0,72	0,7
Tanzania	0,4	0,29	0,4
Mozambique	0,36	0,35	0,36
Rwanda	0,24	0,17	0,33

(Source: ITU)

South Africa is the biggest market in terms of the number of fixed-line subscribers of the countries reviewed. This is followed by Nigeria, which has three times the population of South Africa, but which saw some fixed-line growth, while South Africa's fixed-line market has been stagnant. However, nominal figures do not accurately capture the level of access to fixed-line services within a respective country. Table 6 depicts the number of fixed lines as a percentage of the population. Tunisia, South Africa, Botswana and Namibia have the highest fixed-line teledensity. This can be attributed at least partially to higher GDP per capita levels. In addition to this, the markets have had strong fixed-line incumbent operators with well-established bases that have enjoyed a monopoly over the fixed-line segments.

Despite the introduction of competition in South Africa, fixed-line penetration remains low. This is partly due to regulatory bottlenecks that delayed the launch of the second national operator and the substitution effect of mobile services.

The teledensities of below 3% of the other countries under review are the result of many factors. Among them the failure or inability to privatise incumbents, who are generally as a result unable to capitalise on the modernisation of their networks for mobile competition. Many of these markets have also not been liberalised, which means that if the incumbent is privatised the country is simply left with a private monopoly, more efficiently able to extract profits but without the public interest mandate of public monopolies.

It is evident from Table 6 that in 2008 there was a decline in the number of fixed-line subscribers as a percentage of the population in all of the countries with the exception of Botswana, Burkina Faso, Cote d'Ivoire, Cameroon and Kenya. In 2009, there was an increasing trend in the number of fixed-line subscribers as a percentage of the population across all the countries with the exception of Botswana, Cote d'Ivoire, Ethiopia, Namibia and South Africa.

The rise in the number of fixed-line subscribers can be attributed to the increase in competition following the introduction of service neutral licences. In addition, fixed-wireless operators emerged as significant challengers in both the fixed and mobile market segments. The low penetration in the fixed-line market created opportunities for the CDMA operators to provide wireless local loop services. In Ghana, for instance, the introduction of CDMA technology had a significant impact in reviving the fixed-line market segment. Kasapa, the sole CDMA operator, is aggressively marketing its fixed wireless service dubbed "Kasapa Home-Work".

Mobile

Between 2006 and 2008, South Africa and Tunisia maintained their leadership positions in terms of the number of mobile SIM cards as a percentage of the population, though in 2008, Nigeria officially passed South Africa to become the country with the greatest number of mobile subscribers in absolute terms. In 2009 Botswana passed both South Africa and Tunisia to become the country with the greatest mobile penetration, according to the ITU.[16] In addition, there has been tremendous growth in Cote d'Ivoire, Ghana and Senegal. Even countries like Burkina Faso and Rwanda, at the bottom of the index, have experienced significant growth levels, with the number of subscribers tripling or even quadrupling between 2006 and 2009.

Table 9: Mobile SIM cards as a percentage of the population

	2006	2007	2008	2009
Botswana	44,10	60,86	77,34	96,12
Tunisia	73,60	77,89	84,59	94,96
South Africa	81,54	86,02	90,60	92,67
Ghana	23,30	33,25	49,55	63,38
Cote d'Ivoire	20,70	37,11	50,74	63,33
Benin	13,00	24,45	41,85	56,33
Namibia	29,73	38,31	49,39	56,05
Senegal	25,75	30,53	44,13	55,06
Kenya	19,96	30,06	42,06	48,65
Nigeria	22,40	27,35	41,66	47,24
Tanzania	14,37	20,16	30,62	39,94
Cameroon	17,20	24,31	32,28	37,89
Zambia	13,84	21,43	28,04	34,07
Uganda	6,77	13,69	27,02	28,69
Mozambique	11,00	14,08	19,68	26,08
Rwanda	3,41	6,72	13,61	24,30
Burkina Faso	7,10	10,94	16,76	20,94
Ethiopia	1,10	1,54	2,42	4,89

(Source: ITU)

Table 9 below compares the number of subscribers as a percentage of the population in each country between 2006 and 2009, which is often erroneously reflected as the number of individual subscribers or portion of the population with mobile phones. The penetration rate refers not to how many people own mobile phones (subscribers) but to the number of SIM cards sold. Moreover, most markets are characterised by multi-SIM usage, which suggests that the penetration rates are lower than stated in official statistics. Despite over-counting, it is evident that there has been rapid growth in the adoption of mobile services and there are significant differences between 2006 and 2009. However, in light of the use of multiple SIM cards, the number of new subscribers is lower than is stated with an over-count generally of between 5% and 15% (see Gillwald and Stork, 2008).

Competition is prevalent in most markets and customers are highly price sensitive. As a result, customers obtain multiple SIMs in order to enjoy the competitive rates and promotions on different network. In some countries, like Benin, off-net interconnection costs are high and therefore customers prefer to make on-net calls and use multi-SIMs to communicate.

The growth in the mobile market can be attributed to the increase in the number of mobile operators, investments in mobile networks in terms of coverage, the availability of differentiated products which have increased customer choice, access to low cost handsets, the availability of competitive tariffs and in some markets the introduction of low denomination vouchers, which have made mobile services more accessible to the poor.

Internet

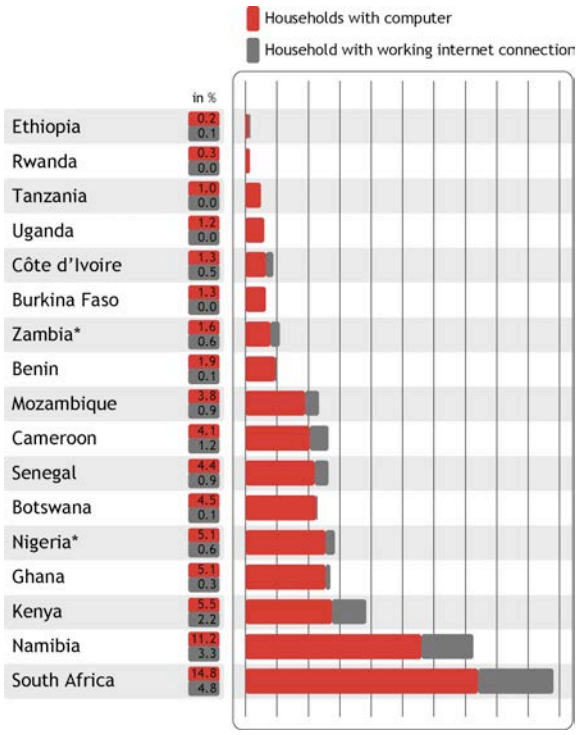
Development of the Internet market in Africa is in its nascent stage. Table 8 below depicts Internet users and broadband subscribers as a percentage of the population. In 2009, Tunisia had the highest number of Internet users as a percentage of the population, at 34.07 %. Like South Africa, the rapid uptake of Internet in Tunisia is based on its higher GDP per capita levels, though it managed to increase this far more significantly than South Africa, which only stands at 8.82% according to the ITU. Nigeria comes in second with 28.43%, then Kenya with 10.04%, Uganda with 9.78 %, South Africa with 8.82 %, and Senegal with 7.36%. The remainder of the markets have a penetration rate of less than 7%, which explains the gap between North Africa and sub-Saharan Africa. Low bandwidth and high prices

[16] The 2007-2008 RIA Household and Individual User survey for example found that the percentage of the population 16 years and older with duplicated SIM cards ranged from 4.5% in Zambia to as high as 36.2 % in the case of Benin.

have been major challenges in the development, penetration and use of Internet services across sub-Saharan Africa. Many countries rely on satellite communication for bandwidth, due to the limited reach of the traditional fixed-line networks and lack of access to undersea cables. With the high cost of satellite connectivity price, access prices are invariably high. The landing of a number of undersea cables, like SEACOM and EASSy, have lowered the cost of accessing Internet services and is expected to drive demand for Internet services. Further cables, including the West African Cable System (WACS), are expected to land in 2011.

Figure 5 – Households with a working computer and Internet

(Source: RIA 2007/8)



Where cables have landed, such as Kenya and South Africa, wholesale prices tend not to have been passed on to consumers in terms of price reductions or subscriptions. Instead, subscribers have been provided with more bandwidth for the price they are currently paying. While this is welcomed by a highly frustrated, low-capped group of current, largely elite users, from a policy point of view it is unlikely to drive greater take up of broadband services, which are extraordinarily costly by international standards.

The true potential of the undersea cable projects will only be realised when there is a terrestrial infrastructure in place and this depends on the ability of the governments and operators to deploy fibre cables in the respective markets. An effort in this regard is the roll out of the Central African Backbone, a project financed by the World Bank for the CEMAC region. However, unless national regulations are updated to ensure an open access model to this new infrastructure, it will not bring about the intended results in terms of increased access and quality and reduced prices of bandwidth.

TUNISIA – BROADBAND DEVELOPMENT

Competition has largely occurred at the service level, with five Internet services providers in the market, namely Tunet, Topnet, GlobalNet (GNet), Hexabyte and Planet, rather than network competition where incumbent, Tunisie Telecom (TT) has a monopoly on the wholesale broadband market.

As a result, all the other ISPs in Tunisia resale TT's ADSL. In 2008, intense competition between the top three players, Tunet, Topnet and GNet, resulted in price wars and significant reductions in the cost of accessing broadband services. There are two main elements of ADSL subscription in Tunisia: subscription fees payable to the service provider (ISP) and others payable to Tunisie Telecom (TT).

In 2008, the Tunisian regulator introduced a policy that subscribers should be allowed to double their current access speeds at the same cost (ISP component) annually. For example, in 2007, when TT announced the availability of 1Mbps services, subscribers on 512kbps speeds could upgrade to 1Mbps speeds and continue paying their 512kbps subscription fees. Subscribers on 256kbps packages could migrate to 512kbps and pay their old subscription. This policy is intended to facilitate seamless migration by Tunisian Internet users to higher access speeds, with greater usage.

In addition, there is a need for governments to create enabling regulatory environments in order to attract investment. In the absence of or delays to the roll out of national backbones for broadband services in most African countries, mobile operators are playing a lead role in infrastructure backbone developments. In some cases the state has taken the lead in developing national backbone infrastructure. For example, the Nigerian Government has set up a company called the

Backbone Connectivity Network (BCN) to be a neutral wholesale telecommunications provider. The company has laid out fibre throughout Nigeria. Other countries have adopted Build, Operate and Transfer (BOT) strategies. For example the Kenyan government contracted three companies to construct a National Terrestrial Fibre Optic National Network (FONN), also known as the National Fibre Optic Backbone Infrastructure, which is aimed at providing terrestrial links to major towns and commercial hubs. Over 5000km of fibre was laid across the country at a cost of $130 million. The government plans to expand the backbone infrastructure to the borders of neighbouring countries like Tanzania, Uganda and Ethiopia. Uganda and Rwanda have embarked on similar backbone infrastructure projects. These countries have contracted third parties to build the infrastructure and ownership with be transferred to the governments upon completion of the projects.

Table 10: Broadband Internet subscriptions in 2009

	Internet Subscriptions in 2009 per 100 Inhabitants	Internet Users in 2009 per 100 Inhabitants	Fixed Broadband Internet Subscriptions in 2009		Mobile Cellular Subscriptions with Broadband Access 2009	
			per 100 population	Total	per 100 population	Total
Tunisia	4,03	34, 07	3,63	372 818		
South Africa	Not available	8, 82	0,96	481 000	10,52	5 271 825
Botswana	Not available	6, 15	0,77	15 000	2,97	58 000
Senegal	0,47	7, 36	0,47	58 720		
Ghana	0,38	5, 44	0,11	27 399	0,24	58 007
Rwanda	1,47	4, 50	0,08	8 388	0,15	15 177
Zambia	Not available	6, 31	0,06	8 000	0,03	4 314
Mozambique	0,059	2, 68	0,05	12 502	0,40	92 468
Nigeria	0,58	28, 43	0,05	81 958	4,89	7 565 435
Cote d'Ivoire	Not available	4, 59	0,05	10 000		
Burkina Faso	Not available	1, 13	0,04	6 000		
Kenya	2,11	10, 04	0,02	8 349	4,98	1 981 048
Benin	0,21	2, 24	0,02	1 791		
Namibia	Not available	5, 87	0,02	430*	1,48	32 211
Uganda	0,91	9, 78	0,02	6 000	1,10	360 000
Tanzania	Not available	1, 55	0.02*	6,439**	1,37	601 324
Cameroon	0,13	3, 84	0,00	900	0,49	96 600
Ethiopia	0,58	0, 54	0,00	3 498	0,10	84 773

** Telecom Namibia had 6000 ADSL subscribers in November 2009*

*** Tanzania ITU data for 2008*

(Source ITU)

Figure 5 is based on a household survey conducted by RIA between 2007 and 2008. It is evident that personal computer ownership is extremely limited, and that the majority of households have very little or no Internet connection, which indicates that there is a need for demand-supply stimulation required for nations to become connected. A major hurdle is the cost of personal computers and Internet enabled devices. Broadband access across sub-Saharan Africa is in its infancy. In 2008, most countries surveyed had fixed broadband penetration rates of less than 2%. Although mobile operators have introduced mobile broadband services including 3G and 3.5G, use of these services remains limited. The majority of customers use basic-feature mobile phones and the cost of accessing Internet enabled mobile devices is prohibitive. Evidence of the availability of broadband services is found in Tunisia and South Africa where ADSL has been overtaken by mobile broadband. South Africa was one of the earliest countries to introduce broadband, but Tunisia has greater penetration. This is due to higher levels of connectivity and backbone infrastructure development within the North African region as a result of state investment.

Policy Outcome: Pricing

Price is the ultimate indicator for competition. Monitoring prices and hence cost to end-user remains a key regulatory function to measure competitive pressure and monitor affects of regulatory interventions to establish or maintain fair competition among existing operators. Mobile penetration rates and mobile retail prices in a country depend on many factors, such as number of fixed and mobile operators, sequence of market entry, technologies deployed, market share of operators, user profiles of subscribers, disposable income, business models used by operators, penetration of substitute technologies like fixed-line and cable TV, past regulatory interventions and sequence of it, regulatory strategies, communication laws and policies and many other social and economic factors. Monitoring pricing strategies of mobile operators is useful for several regulatory functions and important in measuring policy and regulatory outcomes.

Cost of Mobile Ownership

In a global pricing study Nokia has calculated the monthly total-cost-of-ownership for mobile phones for a series of countries.[17] [18] Generally, Asian-Pacific countries tend to be lower than the global average. For example total cost of mobile services in Bangladesh and India are around the $10 mark. Latin American countries however tend to have highest costs with countries Brazil and Peru coming in above the $100 dollar mark.

African countries tend to be concentrated in the middle range with the ten most expensive countries above the average of $44 across the countries covered by this study. Topping the list are Morocco, Cameroon, Angola, Swaziland, Cote d'Ivoire and South Africa. These countries compare with the top end of the Latin America countries, but are nowhere near as high as countries like Brazil. The island states of Madagascar and Mauritius, which rank fourth and eleventh respectively, perform more in line with Asia, where the lowest prices seem concentrated. They are followed by Ghana and Sudan, who come in well below the global average at $20. Ethiopia also has a very low TCO, mobile services prices, are not cost-based but set by the government owned monopoly. The negative outcome of this is the low return on investment in Ethiopia, which has inhibited the extension of the network, which primarily serves an urban elite.

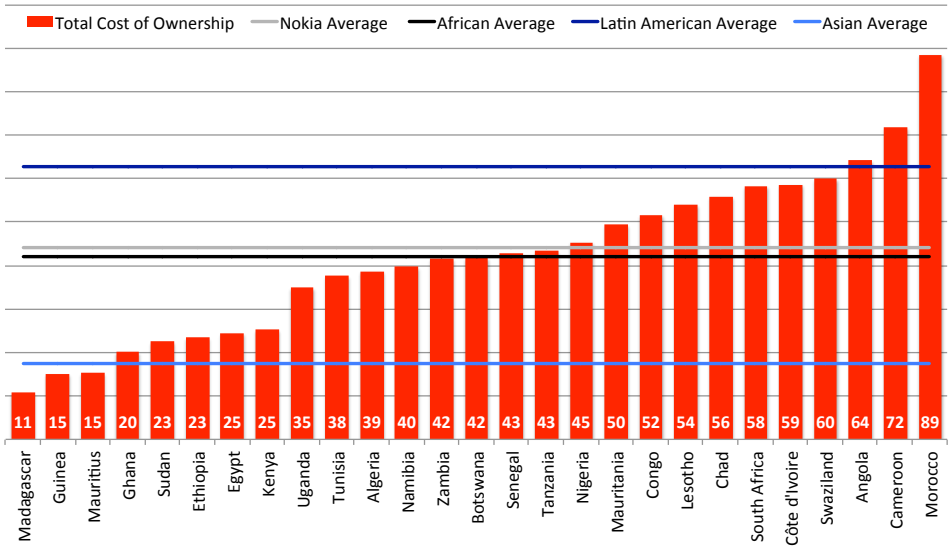


Figure 6 – Total Cost of Ownership in Africa (US$) adapted from Nokia (2007)

[17] Nokia Siemens Networks (2009). How affordable is mobile data? Available online: http://unite.nokiasiemensnetworks.com/adwords/article/view/id/180. (Accessed June 2010)
[18] Nokia Siemens Network (2008). Affordability key in bringing digital inclusion. Available online: www.nokia.com/NOKIA_COM_1/Corporate_Responsibility/Society_/Expanding_Horizons/Subscribe_to_Newsletter/Nokia%20Expanding%20Horizons%2001%202008%20web2.pdf (Accessed September 2010).

While these nominal figures are a good indicator of the differential costs of communication on the continent, adjusting these figures for purchasing power poverty (PPP), as has been done to the pricing baskets used for this policy paper, demonstrates the real cost of services within the context of each economy and the affordability for users. When Uganda's prices are adjusted for PPP for example, mobile services in that country become amongst the most expensive. This will be followed by an example of how the baskets can be used for regulatory supervision. This will then be demonstrated using the case of Namibia where OECD basket methodologies were used over a period of five years to monitor sector developments and measure the impact of regulatory interventions.

The generally high cost of services is reflected in Figure 6 below. This depicts the monthly total-cost-of-ownership of mobile data. Generally, Asian countries tend to be lower than the global average. For example, the total cost of mobile services in Bangladesh and India is around the $10 mark. Latin American countries, however tend to have costs above the average mark, with countries like Brazil and Peru coming in above the $100 dollar mark.

Prepaid Mobile Pricing

The OECD basket methodology used below is based on the 2006 definitions (OECD 2006). The OECD released new basket definitions in April 2010 (OECD 2010). One key difference between the 2006 and the 2010 mobile basket definition is the range of operators to include. The 2006 definition included dominant operators that together have 50% market share. The 2010 definition includes the two largest operators. Those countries with just two licensed operators would automatically include all operators.

Generally, the basket methodology has strength and weaknesses. Strengths include the ability to compare products of an operator, comparing cheapest products of operators, and comparing cheapest products available in a county. This allows benchmarking of countries, operators and products. The basket methodology, applied consistently, allows consumers to compare products within and between operators. The weaknesses are that:

- The OECD methodology of 2006 only includes dominant operators, the 2010 baskets only the two largest operators. Price changes following regulatory interventions would mainly be expected from small operators that attempt to gain market share through lower prices. On the other hand, dominant operators reflect what people really pay better than comparing the cheapest product available in a country.
- OECD baskets do not take into account the number of people on each package and actual minutes of use for each package. No one is an average user and actual consumption patterns of an individual might only poorly be reflected, but it does allow for comparison.
- The same basket is used for all operators, while subscribers of smaller operators are likely to have a different off-net/on-net ratio compared to larger operators.

Compensating for some of these weaknesses, this paper applies the basket methodology of the 2006 definitions to all operators from 18 African countries, including all prepaid products.

Figure 7: Share of mobile subscribers that were prepaid users in 2007/8 (RIA household survey)

The basket methodology can also be applied to post-paid products. This would increase the complexity of the data analysed tremendously but could be the subject of further studies. This paper only uses prepaid products, given that the vast majority of Africans mobile phone users use prepaid (see Figure 7).

The RIA database comprises 184 mobile prepaid products from 112 operators from 26 countries. The OECD mobile pricing basket methodology of 2006 was implemented with minor adaptations. MMSs were, for example, not included because it has not widely used outside of the major markets. Friends and family offers or preferred number plans, which offer unlimited calls to certain numbers on the same network, were not taken into account as they make the process too complex. Promotions for particular days or for certain recharge denominations were also not taken into account.

Table 11: Cheapest prepaid product in a country compared with cheapest prepaid product from dominant operators for OECD usage baskets (2006 definition) for 18 RIA countries

	Cheapest Prepaid Product in the Country in USD			Cheapest Prepaid Product from Dominant Operators			Difference (% = difference / dominant price)					
	Low User	Medium User	High User	Low User	Medium User	High User	Low User		Medium User		High User	
							%	USD	%	USD	%	USD
Botswana	5,04	10,28	20,67	5,04	10,28	20,67	0%	0,00	0%	0,00	0%	0,00
Ethiopia*	3,74	7,59	14,98	3,74	7,59	14,98	0%	0,00	0%	0,00	0%	0,00
Mozambique	7,45	15,07	29,88	7,45	15,07	29,88	0%	0,00	0%	0,00	0%	0,00
Senegal	6,12	12,31	24,25	6,12	12,31	24,25	0%	0,00	0%	0,00	0%	0,00
South Africa	7,64	15,38	29,63	7,64	16,12	33,13	0%	0,00	5%	0,74	11%	3,50
Tunisia	5,06	10,24	20,19	5,06	10,24	20,19	0%	0,00	0%	0,00	0%	0,00
Zambia	6,57	13,28	25,99	6,60	13,54	26,37	0%	0,03	2%	0,26	1%	0,38
Cameroon	8,59	16,42	30,45	9,30	17,91	33,22	8%	0,71	8%	1,49	8%	2,77
Uganda	6,33	12,90	24,05	6,95	13,90	26,85	9%	0,62	7%	1,00	10%	2,80
Burkina Faso	11,04	22,65	45,19	12,54	25,98	52,52	12%	1,50	13%	3,33	14%	7,33
Côte d'Ivoire	7,00	14,34	28,88	8,15	16,34	31,59	14%	1,15	12%	2,00	9%	2,71
Ghana	2,29	4,36	8,01	3,04	6,10	12,16	25%	0,75	29%	1,74	34%	4,15
Benin	4,92	11,05	24,75	7,50	14,74	27,84	34%	2,58	25%	3,69	11%	3,09
Kenya	3,35	6,37	11,42	5,93	11,82	22,78	44%	2,58	46%	5,45	50%	11,36
Namibia	5,06	10,74	22,19	8,96	18,27	36,19	44%	3,90	41%	7,53	39%	14,00
Rwanda	3,74	7,94	16,59	6,87	13,63	26,45	46%	3,13	42%	5,69	37%	9,86
Nigeria	3,63	7,58	15,48	7,76	15,85	32,13	53%	4,13	52%	8,27	52%	16,65
Tanzania	2,93	6,06	12,24	7,26	15,24	31,84	60%	4,33	60%	9,18	62%	19,60

** Ethiopia only has one operator*
(Source: www.researchictafrica-data.net)

Tables 11 and 12 compare the cheapest prepaid products available from incumbent operators according to the 2006 definition, to the cheapest prepaid product available in a country. The difference between these methodologies represents the pressure of competition within these countries, and indicates who offers the cheapest mobile prepaid offers.

Other characteristics have been included in Table 12, such as the number of operators and years since the last market entry, to demonstrate that there are no linear relationships between individual characteristics.

A difference between the cheapest product in a country and the cheapest product from dominant operators may measure the competitive pressure but it may also have little explanatory power. In Botswana, for example, the dominant operator Mascom is also the cheapest operator. It is likely that Mascom became the dominant operator because of its price leadership. The fact that the fixed line incumbent was not granted a licence initially may have provided the two first entrant s with an opportunity to compete within the market. Orange and Mascom were the first mobile licences issued and were licensed at the same time. Price developments and competitive pressure are

functions of many factors. Applying the basket methodology to all operators and analysing the differences between cheapest and dominant operator adds one more perspective and provides regulators with one more tool to monitor the level of competition in the sector.

The competitive pressures on pricing are becoming evident in certain markets. Towards the end of 2010 Ghana had the lowest pricing for the low usage basket of the countries surveyed. This has been driven by the fierce competition between five mobile operators. Similar trends are found in the medium and high user baskets.

Ethiopia's prices are low but these are politically determined and not necessarily cost-based. Low prices in Botswana and Kenya may well be the result of a pass through from regulated reductions in the call termination rate, as may Tanzania's, though they are little higher and extremely high when adjusted for purchasing power parity.

Table 12: Cheapest prepaid product in a country compared with cheapest prepaid product from dominant operators for OECD usage baskets (2006 definition) for 18 RIA countries

	Difference (% = difference/ dominant price)			Telecom-munication Operators	Years Since Last Entry	Cheapest Operator for Low User Basket	Dominant Operator	Mobile Penetration (ITU ICT eye for 2008)
	Low	Medium	High					
	%	%	%					
Botswana	0%	0%	0%	3	2	Mascom	Mascom	77.34
Ethiopia*	0%	0%	0%	1	11	ETC	ETC	2.42
Mozambique	0%	0%	0%	2	7	mCel	mCel	19.68
Senegal	0%	0%	0%	3	1	Orange	Orange	44.13
South Africa	0%	5%	11%	3	8	MTN	MTN & Vodacom	90.60
Tunisia	0%	0%	0%	2	8	Tunisiana	Tunisiana	84.59
Zambia	0%	2%	1%	3	7	MTN	Zain	28.04
Cameroon	8%	8%	8%	2	10	Orange	MTN	32.28
Uganda	9%	7%	10%	4	2	Uganda Telecom	MTN	27.02
Burkina Faso	12%	13%	14%	3	9	Telcel	Zain	16.76
Cote d'Ivoire	14%	12%	9%	4	3	Moov	Orange & MTN	50.74
Ghana	25%	29%	34%	5	3	Tigo	MTN	49.55
Benin	34%	25%	11%	5	3	Libercom	MTN & Moov	41.85
Kenya	44%	46%	50%	3	2	Orange	Safaricom	42.06
Namibia	44%	41%	39%	3	1*	Telecom Namibia	MTC	49.39
Rwanda	46%	42%	37%	3	1	Rwandatel	MTN	13.61
Nigeria	53%	52%	52%	7	4	Starcomms	GloMobile & MTN	41.66
Tanzania	60%	60%	62%	9	5	Benson	Vodacom	30.62

** Telecom Namibia's Switch was restricted to fixed-wireless service until May 2009. Since then it has been offered as a mobile service.*

(Source: www.researchictafrica-data.net)

Despite there being only three operators in Zambia, with a strong dominant player in Zain, who is not tied to the fixed-line incumbent, prices have dropped. Tunisia also has amongst the lowest prices, despite having a duopoly in mobile communications. Duopolies generally lead to price matching, and this is likely to be the explanation for the very high prices in Cameroon and countries with de facto duopolies such as South Africa with two strong incumbents in the mobile market and little competition. The only country more expensive is Burkina Faso. Other than Senegal, prices in Francophone countries are amongst the highest. Adjusted for purchasing power parity Burkina Faso remains the highest, followed by two other poor countries, Tanzania and Uganda – despite their relatively good performance before the adjustment. The excellent regulatory efforts in Kenya, Uganda and Tanzania to reduce prices are undermined, however, by the special taxes on communications equipment and services. For instance, telecom equipment in Tanzania is subject to 20% import duty and 20% VAT, and there is 7% special tax on mobile airtime. Even higher taxes apply in Uganda, an effective 30% duty on cell phones and services, which raises the costs of accessing mobile services.

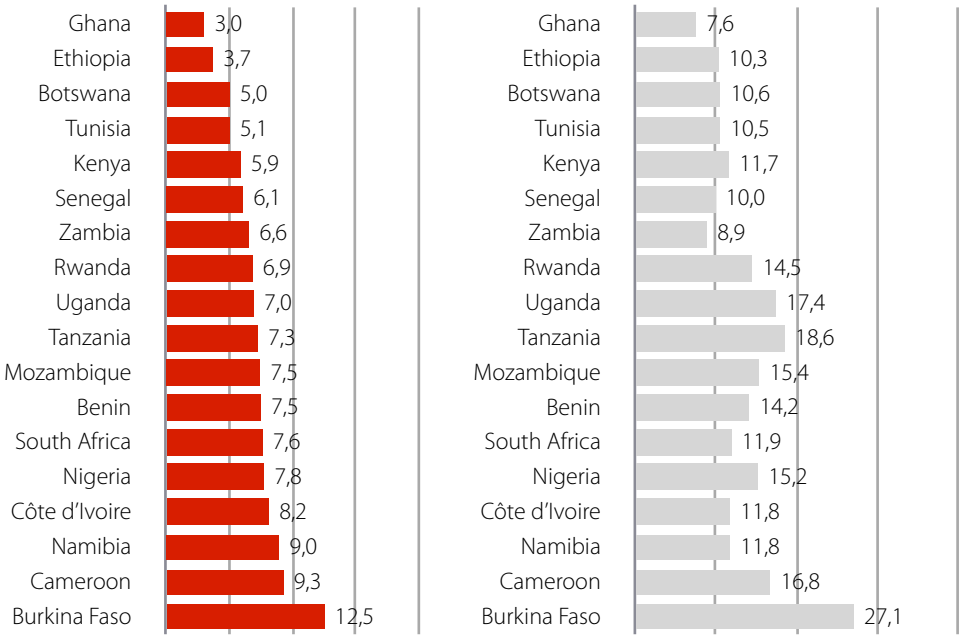


Figure 8: OECD Mobile Low Usage Basket USD and PPP

(Source: www.researchictafrica-data.net)

Internet Expenditure

Figure 9 depicts the results of the RIA demand-side survey conducted in 2007/2008. The likely explanation for the different average individual spend per week of Internet users in different countries is complex, but includes the different costs of services, where they are being accessed, the GDP per capita of countries, and the discretionary income available for Internet usage. Namibia's Internet penetration is low for a lower middle-income country. It reflects use largely by a small elite likely to be able to afford relatively expensive services. Countries like Senegal, Nigeria, Cameroon and Kenya have lower GDP per capita but Internet penetration.

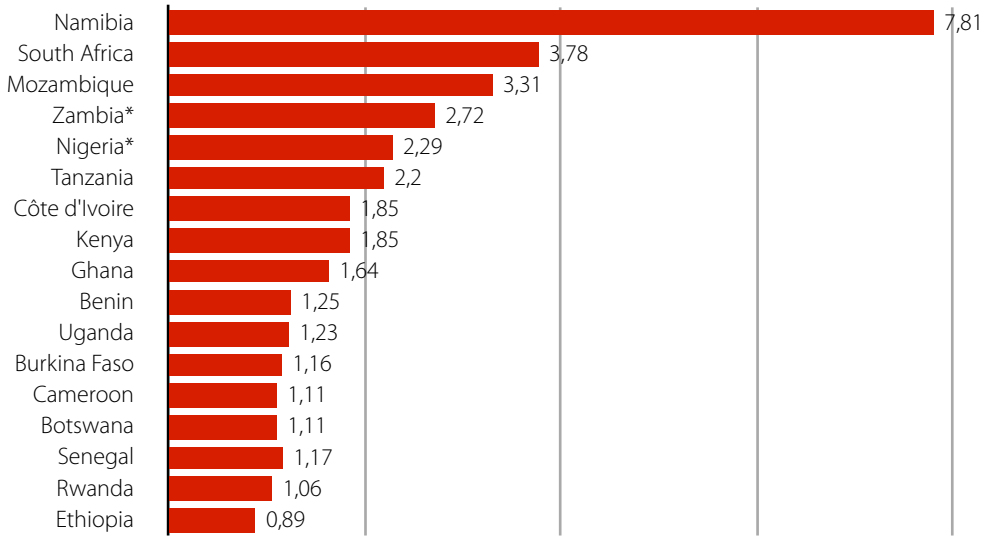


Figure 9: Average Internet expenditure per week in US

(Source: RIA ICT Access and Usage Household and Individual Survey 2007 -2008)

Telecommunication Regulatory Environment (TRE)

The TRE[19] assessment is a diagnostic instrument for assessing the performance of policy and laws affecting the telecom sector, and the various government entities responsible for implementation. The desired objective of telecom policy reform and regulation is improved sector performance, measured by connectivity, price, quality of service and choice. The survey asks stakeholders to assess the telecom regulatory environment across seven dimensions (market entry, allocation of scarce resources, interconnection, regulation of anti-competitive practices, universal service, tariff regulation and quality of service) for the fixed, mobile and VANS/ISP sectors. Of these, the first five dimensions are based on the Reference Paper of the Fourth Protocol of the General Agreement on Trade in Services and reflect the broadest international consensus of the most important aspects of telecom regulation.[20] A dimension for tariff regulation and quality of services was added after pilot studies found these measures necessary for any assessment of regulatory effectiveness. The Reference Paper also refers to the independence of the regulator, but this was left out of the dimensions selected because it is seen as a process variable different from the other outcome variables.

Using the Likert Scale, each of the seven dimensions is scored on a scale of 1 to 5, where 1 is highly ineffective and 5 is highly effective. The Likert Scale is a well-known psychometric response scale often used in questionnaires. The findings are converted into a positive and negative scale for each of the elements of the survey, and combined for an overall score for each country.

The TRE can also be used to assess regulatory risk in a country, particularly by those considering investment opportunities in the telecom sectors of more than one country, with the TRE ranking of the countries indicating regulatory risk. Regulatory risk refers to risks emanating from government action, including but not limited to the actions of the actual sector-specific regulatory agency with authority over the industry in question.

Investment is necessary for improving sector performance and investment risk is the primary determinant in making investment decisions – the higher the risk, the higher the potential rate of return. At the point of investment, investors consider risks associated with three environments.

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The macro-level or country risk comprises factors that may affect the entire economy, such as inflation and foreign exchange fluctuations, as well as overall political stability. Market or commercial risk is comprised of factors such as demand, effect of substitutable products and services, and performance of competitors. Risk is partially a matter of objective analysis. An investor can calculate an expected rate of return on a new investment based on factors within his control and assumptions based on factors outside his control. However, risk is, to a great extent, also a matter of perception. Macro-level and regulatory risks are both difficult to measure objectively, but at a minimum, a subjective measure of both is necessary when making an investment.

The scope presented in this toolkit is the regulatory environment within which telecom operators and potential new entrants function; that is, a subset of the overall regulatory risk environment here described as the telecom regulatory environment, and which includes only telecom-specific aspects.

The TRE methodology presented here is a measure of perception that is affected by a number of different factors. Responses can be coloured by the political and cultural ethos with in a country, traditions or practices of respect or acquiescence that do not allow for the open critique of state processes or institutions that other countries may tolerate or encourage, despite the guarantees of anonymity built into the survey.[21] The verification process of the survey seeks to establish the basis of the collective perception of the different elements of regulatory effectiveness in terms of actual events and regulatory developments on the ground. In the case where sector performance indicators show performance that can be considered satisfactory but TRE scores are low, it may be possible that the problem is the communication of the regulatory actions. If the latter conclusion were reached, the appropriate action would be to improve the way the regulatory authority communicates its actions.

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[19] The original TRE instrument was designed to assess regulatory effects on investment (see Samarajiva & Dokeniya 2005). The TRE survey was devised by RIA's sister network LIRNEasia (www.lirneasia.net) and has subsequently been developed and adjusted for surveys in Latin America and Africa. This survey builds on the 2006 RIA TRE survey, the results of which can be found in Esselaar, Gillwald &Stork (2007)

[20] http://www.wto.int/english/tratop_e/serv_e/telecom_e/tel23_e.htm

[21] For instance, in the Zambian case, the perception seems to be influenced by a highly publicised court case against the Minister of Communications over alleged corrupt practices in the privatisation of Zamtel. Furthermore, the subsequent lack of transparency in the sale of Zamtel (75%) to Lap Green of Libya (another state owned company) has continued to permeate the public forum.

The different stakeholders that are involved in the TRE have been grouped into three categories according to their common interests.

- **Category 1:** Stakeholders directly affected by telecom sector regulation. E.g. operators, industry associations, equipment suppliers, investors
- **Category 2:** Stakeholders who analyse the sector with broader interest. E.g. financial institutions, equity research analysts, credit rating agencies, telecom consultants, law firms
- **Category 3:** Stakeholders with an interest in improving the sector to help the public. E.g. academics, research organisations, journalists, telecom user groups, civil society, former members of regulatory and other government agencies, donors, current government employees from organisations related to the telecom sector excluding those in the telecom regulatory & policy hierarchy (i.e. excludes anyone from the regulatory agency, policy making body (often Ministry of Post and Telecom or similar), the Minister in charge of Telecommunications etc.).

Ideally each category should make the same contribution to the final result. In order to achieve this balanced representation, over-represented categories are given a weight of less than one and under-represented categories are given a weight of greater than one, in such a way that all three categories contribute equally to the final score.

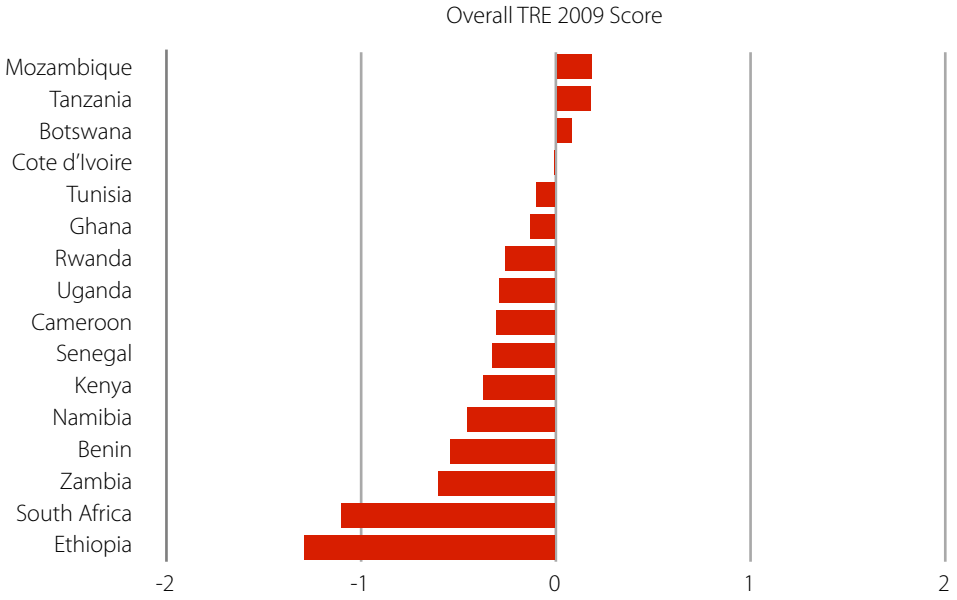

Figure 10. : Overall TRE 2009 Score (-2 = very inefficient, +2=very efficient)

Market Entry

Market entry is the policy key to creating opportunities for investment, and the effectiveness with which it is implemented is a primary factor for assessing regulatory risk. The ability of the regulator to issue licences in a timely and fair manner will determine to what degree the potential of competitive markets are unlocked. As can be seen from the countries represented in the telecommunication regulatory environment survey, Tanzania, Uganda, Ghana, Tunisia and Mozambique scored positively in terms of market entry.

Tanzania is considered to be efficient with regards to market entry due to a number of factors. The country has implemented a non-restrictive regulatory environment, which has introduced competition into the telecommunications sector. Liberalisation of the telecommunications market is in line with the government's broader objective to liberalise the economy through restructuring and engagement of the private sector. The country introduced a converged licensing framework in 2005, which is both technology and service neutral, which has further stimulated industry growth. There are numerous operators licensed under four categories. Notably, 15 licensed network facilities providers, 13 network services operators, 67 application services licensees and 72 content services providers (45 for radio and 27 for television). Although the local loop is not unbundled, operators in Tanzania are offered incentives for network deployment and network-based competition such as investment tax incentives for economic infrastructure development projects. In addition to this,

incentives are provided for cost sharing in the backbone network deployment and use. The Electronic and Postal Communications Act (EPOCA) of 2010 is currently underway in Parliament o address these issues. Despite this positive view of Tanzanian regulatory environment with regard to market entry, this is not reflected in its access figures. Tanzania has the lowest number of fixed lines as a percentage of the populations and is lagging behind in terms of mobile access.

Policy on market entry and the regulation of it is perceived positively in Uganda. The country was one of the first to liberalise the telecommunications market, and implemented a converged licence regime in 2005. The new regime makes provision for technology and service neutrality. The large number of players in different market segments is evidence of a open market environment: there are four fixed-line operators, six mobile operators and twelve Internet service providers. This in turn has stimulated market growth. However, Uganda's positive regulatory perception does not correlate with its market performance – either in terms of access or pricing. In 2008, the country had a very low number of fixed lines as a percentage of the population, just ahead of Tanzania, and the lowest number of mobile SIM cards as a percentage of the population in 2008. This is partially due to the low per capita income in this very poor nation, and the artificially high cost of services as a result of a retrogressive tax on mobile communications.

Market entry in Botswana is perceived positively by stakeholders. In 2007, the telecommunications market was further liberalised through the introduction of service neutral licences, which spurred competition. In 2008, B-mobile, a subsidiary of Botswana Telecommunications Corporation, the fixed-line incumbent, entered the market. In addition to this, the new licence regime enabled the private telecommunications operators, Mascom Wireless and Orange Botswana, to offer both fixed and mobile telecommunications services. Also, a number of data and Internet service provider licences were converted to value-added network services licences, creating opportunities to provide voice over Internet protocol (VOIP) services and wireless broadband.

Botswana's positive perception about market entry correlates with positive performance in terms of access and pricing. The country has a high number of mobile and fixed-line access figures behind South Africa, but fixed-line services are experiencing negative growth. With regards to pricing, mobile calls are relatively low priced in comparison to other countries.

Overall most countries are perceived to have inefficient regulatory environments.

In Ghana, market entry regulation is also perceived positively. In 2008, the market was further liberalised by the licensing of a sixth mobile telephony operator, Globacom, despite a relatively small population of 23,.35 million and GDP per capita of only US $713 in 2008. The number of operators in Ghana is evidence of the implementation of an open-market policy. The market currently has six mobile operators and two national fixed-line operators. Additionally, the Ghanaian Government has reduced its direct involvement in the market. In 2007, it sold 75% interest in Westel, the second national operator, to Zain (formerly known as Celtel). In addition to this, in 2008 the government sold its majority (70%) stake in Ghana Telecom to Vodafone for US $900 million. Furthermore, the international gateway has been liberalised and four companies, namely Vodafone Ghana, Millicom (TiGO) Ghana, MTN Ghana and Zain have been granted international gateway licences. Interestingly, Ghana has performed well in mobile access and pricing, despite the negative perception about market entry within the mobile segment. This perception is in contrast to the fact that, in 2009, Ghana had the lowest mobile pricing out of all the countries surveyed, and has experienced high growth levels in the number of mobile SIM cards as a percentage of the population. However, the country is lagging behind in terms of fixed lines as a percentage of the population.

The positive perception of the regulatory environment in Tunisia seems to reflect the positive response to the licensing of further mobile private mobile operators. In 2002 the market entry of the second operator boosted the telecom sector, which created a generally positive attitude to reform. The third mobile licence awarded to a consortium composed of France Telecom and Divona/Orange was awarded in 2009 and started commercial operations in June 2010, after the completion of the TRE. Its impact will be measured by the next round of the TRE.

Mozambique has a marginal positive score with regard to market entry. The positive perception can be attributed to the positive score in the VANS component of the survey. The mobile and fixed line market received a negative score. This is due to the fact that the fixed line segment has a monopoly market structure, while the mobile segment has had a duopoly structure up until 2010 when a third mobile licence was granted. Delays in licensing the third mobile operator contributed to the negative score in the mobile segment. The overall positive score does not correlate with the market outcomes in terms of access and pricing. The country has some of the highest mobile pricing out of the countries surveyed and some of the lowest mobile and fixed-line access figures.

The rest of the countries surveyed are perceived as being inefficient in terms of regulation of market entry. Ethiopia, for instance, is perceived to be highly inefficient in this regard. This is due to

its policy and regulatory framework, which has been closed to competition for the past two decades, and all operations continue to be state-owned. The market structure is characterised by a vertically integrated monopoly structure where a single operator provides fixed, mobile, Internet services and controls the international gateway services. In addition, the Ethiopian Telecommunications Agency (ETA) is regarded as weak, lacking any real independence from the Ministry of transport and communications, which acts as a department within the Ministry. The Ministry of Transport and Communications is responsible for the appointment of the general manager and chief executive officer of the incumbent operator ETC. Despite the increase in fixed and mobile access through a vendor-sponsored loan agreement between government and the Chinese company ZTE, network growth remains unsustainable due to pricing that is fixed politically at relatively low levels in comparison to markets that have opened up to competition.

In South Africa, market entry has continued to be stifled by the policy of 'managed liberalisation'. Despite the regulators attempt to shift to a horizontal licensing framework; the market remains structured around vertically integrated incumbent operators. The policy and regulatory framework within the sector has not adequately addressed dominant operators, though the Competition Commission has taken a strong stand against anti-competitive practice. The Competition Tribunal is currently hearing a case against Telkom by the value-added network operators. The Competition Commission proposed the maximum fine of 10% of revenues – a whopping R3.7 billion (US$). This followed a previously successfully appealed court decision in Telkom's favour challenging the Commission's referral of the case to the Tribunal for a determination. The Commission has also expressed its intention to investigate collusive behaviour between the mobile operators.

In most countries 'market entry' is perceived negatively as most countries have failed to open their markets sufficiently to enjoy the benefits of competition.

The market structure arising from the policy reform process over a decade has effectively produced duopolies in both the fixed and mobile markets. Further, the vertically integrated fixed-line incumbent, Telkom, retains dominance over the backbone. As a result, despite the entry of the second public switched network operator, Neotel, prices have not decreased significantly neither have services been greatly extended outside of corporate niche markets.

However, state involvement has been varied within the telecommunications market. On the one hand, the state has decreased involvement through selling off portions of Telkom and on the other hand increased involvement through the creation of an infrastructure company, Broadband Infraco. As a result, South Africa is one of the most concentrated markets out of all the countries surveyed, with increased state ownership in the sector, contrary to global trends.

Although, South Africa's overall regulatory efficiency is negatively perceived by stakeholders, the country nevertheless has continued to grow its mobile market in particular. While wholesale prices are high, its retail prices performed averagely of the countries surveyed. For example, South Africa had lower mobile pricing than countries with a positive perception in market entry like Tanzania and Uganda. In addition, in 2009 the country had the third highest number of mobile SIM cards as a percentage of the population. Although it continues to have amongst the highest levels of fixed lines as a percentage of the population, it is experiencing negative growth in this market segment.

In Benin market entry is perceived negatively, although the mobile segment received a positive score due to the presence of five mobile operators. On the other-hand the fixed line segment is characterised by a monopoly, Benin Telecoms, and very low penetration levels. The negative score in the fixed and VANs market negatively impacted on the overall perception of the telecommunications regulatory environment with regards to market entry. Furthermore it takes a long time to obtain a telecommunications license or permit-up to 410 days, which has contributed to the negative perception. Despite the negative perception in Benin of the regulatory environment regarding market entry the country has performed better in terms of mobile and fixed line access than countries that received a positive score with regards to market entry like Tanzania.

In Zambia market entry is perceived negatively, both with regard to the fixed-line and mobile markets. The fixed-line market is characterised by a monopoly. In addition, the government reversed its decision to licence a fourth mobile operator and introduced legislation that restricted the number of operators to three until 2015. This is believed to be a protectionist strategy and part of the deal involving the sale of 75% shares in the state-owned Zamtel to Libya's state-owned LAP Green. Although the Internet sector is considered open to competitors, more than half of the issued licences have been un-utilised since 2006. Moreover, the negative perception is expected to change following the introduction of a converged licensing regime and liberalisation of the international gateway. However, the Government's issuance of a statutory instrument to limit the number of mobile operators to three for the next five years may have confused the message to the market vis-à-vis the ICT policy pronouncements to promote competition in market, perceived as a justification used extensively in the privatisation of Zamtel.

Cote d'Ivoire is perceived negatively due to the prohibitively high cost of acquiring 900Mhz and 1800MHz bands. Operators have not been able to overcome the dominant position of the fixed line incumbent and the high cost of terminal equipment has been a major deterrent to investment in the Internet segment.

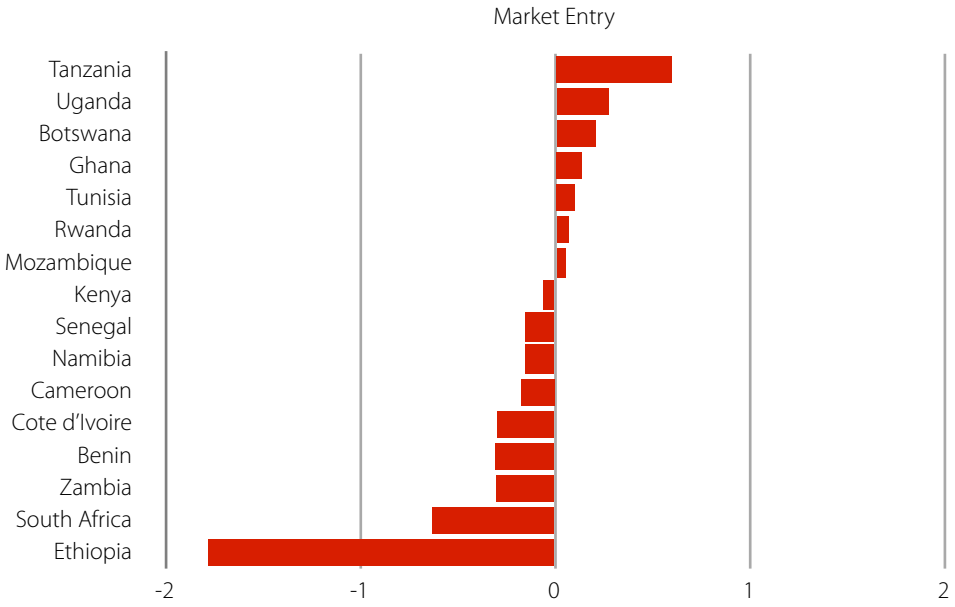

Figure 11: RIA TRE 2009. Market Entry

Market entry in Cameroon is perceived negatively. Despite partial liberalisation in 1998, the mobile market is characterised by a duopoly, while the state-owned operator Camtel has a monopoly over the fixed-line market. However, the country performed fairly well in terms of fixed-line access despite the monopoly market structure. Mobile access figures, on the other hand were low in comparison to other countries.

Market entry in Namibia is perceived as marginally negative. However, market entry has been assessed more positively compared to 2006, with three mobile operators and several strong broadband providers now existent.

Market entry in Senegal is perceived as negative as historically the fixed-line market has been dominated by the incumbent operator and the mobile market has been been characterised by a duopoly until the market was opened up to a third operator, Expresso, the second national operator, which launched early 2009.

With regards to Kenya, the licence fees are considered restrictive and pose a significant barrier to market entry for new players. The resultant market structure is an oligopoly in the mobile market with only four players. For instance, in the mobile sector, the high price of the 3G licence, i.e. USD 25 million, gave Safaricom a de facto monopoly over 3G services. The regulator, as a result of complaints from the other three operators, was forced to bring it down to USD 10 million. The fixed market still only has a monopoly provider, which also owns a significant portion of the largest mobile operator, Safaricom. In 2008, Kenya performed very well in terms of mobile pricing, but still lags behind other countries in terms of access in both the mobile and fixed market segments.

It is evident that liberalisation and open access are essential elements to stimulate competition and market growth. However, these conditions are not sufficient in themselves. There is a need for effective regulation of other factors such as tariffs and interconnection in order to facilitate access to and increase the affordability of services. For instance, although Ghana, Tanzania and Uganda have positive perceptions in terms of market entry, this does not correlate with good market performance. Tanzania and Uganda lag behind other markets in terms of fixed and mobile access, while Ghana has performed relatively well in mobile access and its mobile prices are the lowest out of the countries surveyed.

On the other hand, countries with negative perceptions about regulation of market entry, like South Africa, have high mobile and fixed line access figures, although the fixed-line segment has been experiencing negative growth. Similarly, Kenya had a negative perception about market entry, but performed well in terms of mobile pricing, with prices lower that Tanzania and Uganda.

Access to Scarce Resources

The management of scarce resources such as spectrum, rights of way and numbering is one of the greatest challenges for African regulators. In an increasingly wireless world, access to spectrum is becoming the key competitive issue and inability to gain access a major barrier to investment. The dilemma around spectrum has impacted negatively on the service expansion capabilities of operators, the types of technologies deployed and opportunities for innovation.

The sub optimal use of spectrum has impacted negatively on the service expansion capabilities of operators, the types of technologies deployed and opportunities for innovation.

Tanzania is the only country of those surveyed that is perceived as being highly efficient with regards to regulation of scarce resources. Despite the overall positive view on this matter, some respondents wanted timely, transparent and non-discriminatory access to spectrum allocation. Assignment of telecommunication numbers (numbering resources) and rights of way; frequency allocation; telephone number allocation; and tower/mast locations and safety were also issues of concern.

Mozambique is perceived as relatively efficient in managing scarce resources. The regulation on access to scarce resources is based on international standards and follows a first-come-first-serve principle. Moreover, this was not able to explain why they ranked negatively in the fixed-line and mobile segments. Ghana is considered to be relatively efficient in the regulation of spectrum. A liberal policy in the licensing and frequency allocation is provided under the National Telecommunication Policy of Ghana. The policy also emphasises co-location and facility sharing amongst other things. The policy has eased the usual bureaucracy and reduce restrictions on licensing and allocation of frequency spectrum, especially for data and its ancillary services. This accounts for the positive score.

The close to neutral score for Tunisia relates to the lack of access to broadband spectrum. The allocation of resources for mobile services is regarded as successful.

More than half of the countries surveyed are regarded as inefficient.

Ethiopia is considered highly inefficient in regulating scarce resources, as the regulator has not introduced a spectrum plan due to the government's monopoly over the existing spectrum. Therefore, neither spectrum policy nor guidelines for the usage of spectrum commons are in place.

In South Africa, spectrum availability for new services has been a major source of contention. The regulator has made very little progress in the regulation of spectrum, which is a major bottleneck to market entry and expansion. Sentech, the state-owned entity, has been sitting on 50 MHz in the 2.6 GHz band and on a large allocation in the 3.5GHz band. The allocation in the 2.6 GHz band to Sentech in 2009 was intended for My Wireless, its wireless broadband offering. However, the project was halted in November 2009, following the loss of millions of rands. In March 2010, the Department of Communications in South Africa released a spectrum policy. Under the policy, the national regulator, ICASA, is obliged to enforce strict measures regarding the use of spectrum. Companies that have spectrum are expected to make efficient use of the resource or lose the spectrum under the new "use it or lose it" policy. As a result, Sentech is under pressure to use its spectrum allocation, especially within the 2.6GHz bands, which is currently being sought after by other telecoms operators in order to offer WiMax services, or to return it. The Department of Communications indicated in 2009 its intention to conduct a spectrum audit to establish the state of current usage against allocations. The time-spans on the project, however, suggest that it may take as long as two years, which would cause serious delays in the sector, if major decisions around spectrum are held in abeyance until then.

Regulation with regard to scarce resources is considered inefficient in Benin. This is due to the absence of effective regulation regarding the management and distribution of frequencies. In addition Benin does not have a reliable national frequency distribution table.

In Zambia the management of scarce resources is perceived negatively, despite improvements in numbering and frequency management, which has streamlined management of these resources. In addition, in 2008 the regulator commissioned a frequency monitoring system worth more than $ 4 million dollars. The negative perception appears to be related to the fact that the improvements are communicated to operators and to a less extent to other stakeholders within the telecommunications sector.

Access to scarce resources is perceived negatively in Namibia due to the absence of regulation in this area.

The allocation of scarce resources is perceived negatively in Kenya. This is due to the fact that there is a perception that people have acquired frequencies for speculation purposes but they are not being utilised, creating artificial scarcity.

The negative perception in Senegal relates to challenges regarding access to spectrum and dissatisfaction by operators over the management of frequency bands by the regulator and Ministry of ICT.

The negative perception regarding access to scarce resources in Uganda is due to the over-allocations at the onset of licensing when the market was opening up, as well as non-utilisation of allocated spectrum by some licensed entities. The Ugandan Communications Commission (UCC) plans to re-farm some spectrum, but its plans are not discussed in the public domain. In addition, UCC has become more aggressive in addressing licensees that have delayed the launch of operations after having obtained a license.

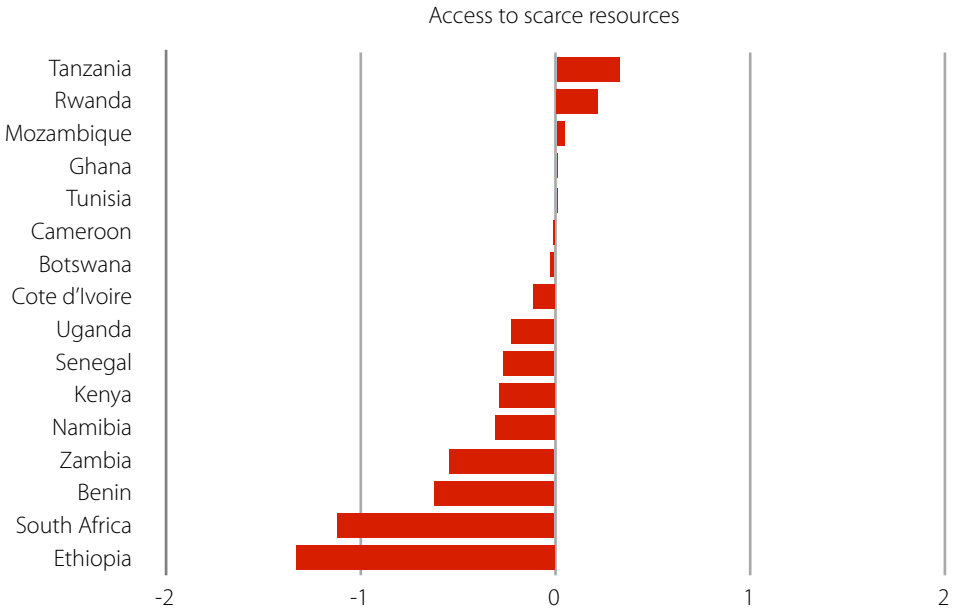

Figure 12: RIA TRE 2009. Access to scarce resources

In Cote d'Ivoire there is a negative perception due to the decline in the availability of the frequencies, particularly the 900 MHz band. In addition there are a plethora of operators competing for this scarce resource. However, some operators have stated that there is a lack of transparency regarding the allocation of some frequencies, which are termed "golden frequencies" , which has contributed to the negative perception.

In Cameroon, management of scarce resources is perceived negatively. This is due to the dispute between mobile operators and radio operators over the allocation of the 800 and 900 MHZ frequencies, particularly inconsistencies regarding allocation of these resources. Despite these challenges, a new 8-digit numbering plan has been successfully implemented.

The management of scarce resources like spectrum, numbers and number portability is critical to realising the benefits of competition. Inefficient management of scarce resources remains a major hurdle to market growth and operator expansion activities. In most cases, the challenges regarding the management of scarce resources are a function of the outmoded policies that govern the telecommunications sector and fail to create enabling environments for competition and innovation.

Interconnection

Interconnection of the telecom system allows users of one network to interact with others in different networks in order to achieve seamless communication. In addition to this, the interconnection between new and existing players facilitates competition within a market.

Mozambique's positive perception is due to the proactive role played by the regulator in regulating interconnection rates, following disputes that arose amongst operators. In 2006 the regulator hired an independent consultant to come up with a proposal for interconnection termination rates. A new agreement was signed between TDM, Vodacom and Mcel in 2007 for rates that would apply in 2008 and 2009. In 2010 new interconnection rates were implemented and the government is in the process of hiring another consultant to propose new interconnection rates.

The positive score in Cote d'Ivoire can be attributed to the fact that interconnection is required by the regulatory authority ATCI. Interconnection rates are negotiated between operators without the interference of the regulator. The contract signed between operators specifies the technical, financial and administration conditions for interconnection. Furthermore, operators must follow the principle of cost-oriented pricing.

In Tanzania regulation of interconnection rates is perceived as being efficient. This is likely to be the result of the effective regulatory intervention in this area. A cost-based interconnection regime has been established in Tanzania. The interconnection model is based on a Forward-looking Long Run Incremental Cost Model (FLRIC). Interconnection rate regulation came into effect on the first of January 2008 and will be reviewed in January 2012. There is complete symmetry for international and all national calls, with incoming international calls terminating at local charges on national networks as stipulated under the interconnection regulation. Despite, the success of wholesale regulation in Tanzania, this has not been passed on to end-users as retail pricing of mobile services remains very high.

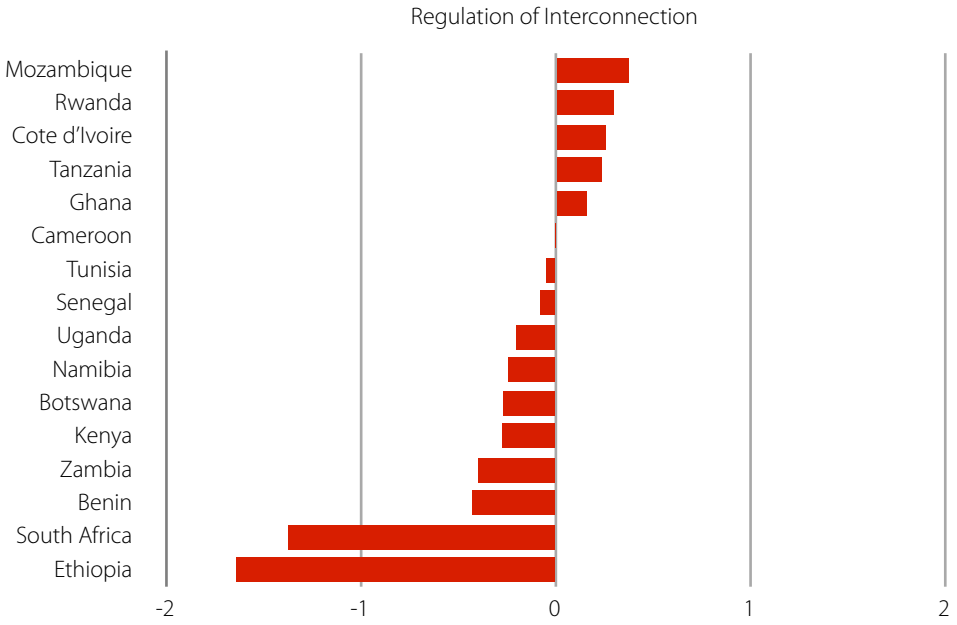

Figure 13: RIA TRE 2009. Interconnection

In Ghana, The Electronic Communication Act, 2008, Act 775 mandates all licensed public telecom operators to interconnect, but companies with significant market share are to provide facilities for physical interconnections. At present there are two telecom operators with significant market share, namely MTN Ghana and Vodafone, that are required to provide infrastructure for physical interconnection. The interconnection regime in Ghana has been undergoing reform for years. An interconnection technical committee has been established with the objective of resolving all technical problems associated with interconnection. Finally, a model for determining interconnection rates was developed by an independent consultant in 2007 and accepted by all telecoms operators. The interconnection model is based on Long Run Incremental Costs (LRIC). The interconnection determination in Ghana accounts for its positive perception.

Cameroon is perceived neutrally with regards to regulation of interconnection. This perception seems to be linked to the duopoly situation in the mobile segment. The two mobile operators, namely MTN and Orange Cameroon, managed to solve the interconnection issue without any regulatory intervention, and therefore termination rates are not a contentious issue for the moment. Users are able to communicate on and off net in a seamless matter. The interconnection problem might arise with the entrance of the two new mobile operators, announced by the Ministry of P&T in June 2009.

Tunisia again received a neutral score, suggesting an adequate level of regulatory efficiency, but greater invention might push this into positive terrain.

The absence of competition in both fixed and mobile markets within Ethiopia means that interconnection is not a major pre-occupation and therefore there is no regulation concerning it. The operator runs a single seamless network and no termination fee is charged between the mobile and fixed network.

In South Africa, in 2009, the Ministry of Communication intervened to address interconnection pricing. Also, the parliament challenged the, regulator on its failure to bring down mobile termination rates. This has compounded the negative perception of the regulator and raised questions around its ability to regulate effectively. The price dropped from R1.25 to 89c following the Ministerial recommendation. In addition, operators proposed a further price reduction, but the regulator has withstood pressure from operators to accept voluntary reductions in exchange for a moratorium on termination price regulation. In April 2010 it issued a draft regulation on wholesale termination rates. This is considered a significant step by the regulator and is expected to have a positive impact on ICASA's ability to effectively regulate the market. Any pass through of the termination cost reductions to users however as still to be seen.

In Benin the perception is negative due to the absence of any regulation on interconnection termination rates. Instead interconnection rates are determined after the negotiation between operators under the supervision of the regulatory authority.

In Zambia interconnection regulation is perceived negatively. This is due to Zain's dominant position in the market, which has gone unchecked by the regulator and competition authorities, previously Zambian Communications Authority (now Zambian ICT Authority). Zain is believed to engage in discriminatory practices by charging different interconnection rates against two operators. The Zambia ICT Act of 2009 provides the regulator with powers to intervene in cases where there is abuse of power. In addition, a cost study is underway to determine the appropriate interconnection regime.

Table 13: Interconnection Determination by regulator on 17th Sept 2010 in Zambia

	1 Nov. 2010	1 Jan. 2011	1 Jan. 2012
Mobile to Fixed Termination Voice	USc 5.90	USc 5.30	USc 5.00
Zambia Kwacha Equivalent	K 295.00	K 265.00	K 250.00
Mobile and Fixed Termination-SMS	K 147.50	K 132.50	K 125.00

Although Kenya was one of the earlier regulators to conduct a cost assessment of prices, it lags Uganda and Tanzania in such interventions which might explain why the regulator is perceived as relatively inefficient in regulating of interconnection, despite having one of the lowest interconnection rates in the fixed and mobile segments, and resulting low retail prices. The Commission issued a determination on cost-based interconnection, which came into effect on the 1 March 2007 and is binding to all fixed and mobile operators and a further study is underway. The interconnection rates are based on a glide path and is to be implemented under three phases. The reduction in interconnection rates in the second phase with the entry of Orange Kenya and Yu led to a reduction in end user tariffs between operators. The reduced interconnection rates under the second phase resulted in tariff wars, and existing operators introduced a number of promotional offers that did not comply with the interconnection guidelines. Although operators are required to file tariffs under the current interconnection regime, the regulation does not make provision for promotional activities. This has been a source of contention and resulted in complaints about anti-competitive behaviour.

Botswana is regarded as inefficient in regulating interconnection and facility rates. This is because BTC, the fixed-line incumbent, has a monopoly over the infrastructure backbone and all operators' lease facilities from BTC. The failed negotiations between BTC and other operators over access to infrastructure are the main challenge for the regulator. In response, the regulator introduced new licences that permit operators to build their own infrastructure backbone. In addition to this, the regulator is commissioning a study on infrastructure sharing and its implications on enhancing connectivity in the rural areas. With regards to interconnection fees, BTA does not set fixed interconnection rates, but provides a minimum and maximum fee that can be charged. Operators can then charge any price within the range. Although Botswana's mobile pricing is relatively lower than other countries, high interconnection rates for mobile-to-mobile calls have driven up mobile pricing, which has contributed to Botswana's negative perception. In contrast, Botswana's fixed to mobile interconnection rate is one of lowest out of the countries surveyed, owing to BTC's monopoly over fixed-line services.

Namibia is perceived marginally negatively in the regulation of interconnection, despite the resolution of a termination rate dispute in 2009. In July 2009 the Namibian Communications Commission ruled that termination rates should be standardised to 60 cents a minute and fall to 30 cents by January 2011.

In Uganda, the regulator is perceived to be relatively inefficient in regulating interconnection. The Ugandan Communications Commissions (UCC) approach in the past been ex-post, allowing operators to enter into commercial agreements (cost based or otherwise) and intervening only if such negotiations fail to result in agreement or a dispute arises. With the opening up of the market and resultant increase in competition, incumbents used interconnection rates to create barriers to entry, offering unattractive interconnection rates, which negatively impact smaller players. In response to these challenges, the regulator decided to adopt a cost-based price control of call termination and transmission capacity, effective from November 2009. A bottom-up model was chosen under the incremental cost modelling approach of determination of interconnection rates.

In addition to this the UCC enforced accounting separation to address problems associated with wholesale leased-lines provision. This applies to facilities or infrastructure that UCC may have designated as an essential facility. However, the regulator needs to address its capacity issues in order to effectively enforce its regulations according to industry observers.

Senegal has a negative perception as interconnection up until 2009 remained an unresolved issue.

Although there have been interconnection determinations in Tanzania, Uganda, these have not translated into lower retail pricing. Instead, mobile pricing is significantly higher than other countries, and largely due to their retrogressive tax regime on mobile services. In South Africa, there is uncertainty over the impact of the interconnection determination (early 2010) on retail pricing.

Tariff Regulation

High tariffs have been a major barrier to access telecommunication services and often a key indicator of the lack of competition.

Tariff regulation is regarded overwhelmingly as an area of ineffective regulation. High tariff rates have been a key barrier to access telecommunication services and often a key indicator of the lack of competition. In the interests of achieving universal access objectives, regulators are challenged to establish effective tariff regulation in order to remove the barriers to market growth and access to services.

Despite not having particularly low prices, Mozambique is the only country perceived to have efficient tariff regulation. This result seems related to the intervention by the regulator to settle mobile tariffs based on cost. The regulator requested each operator to come up with a cost-based tariff proposal for negotiation and it succeeded in reaching consensus based on the operators proposals.

The majority of countries are perceived to have inefficient tariff regulation. South Africa is rated the most inefficient regulator out of all the countries surveyed. While fixed lines and ADSL prices have been the subject of regulatory intervention in the past, it has nevertheless left them high by international standards, as demonstrated in the pricing section above. Furthermore, mobile retail prices have not been regulated, with claims by the operators that the market is sufficiently competitive. However, mobile pricing is relatively high in comparison to other countries, considering the high penetration levels and the associated economies of scale and scope.

Ethiopia is also considered to be highly inefficient as tariffs are set by the Ministry and are politically determined rather than cost-based.

In Cameroon pricing is not regulated and is determined by the dominant operators MTN and Orange. The withdrawal of the promise to set a price cap by the General Manager of the Regulatory Board if the operators did not become reasonable on pricing has contributed to the negative perception as customers are increasingly vulnerable to high prices due to the lack of competition.

In Senegal dominant players have historically set prices and this has gone unregulated, which accounts for the negative perception in the 2009 survey.

Benin has a negative perception due to the absence of tariff regulation. The regulatory authority conducted a study in 2009 which showed a significant margin between costs and tariffs charged by operators. Although operators are free to set their own prices, rates charged must be cost oriented.

Also, Uganda is perceived as inefficient in regulating tariffs. Mobile pricing remained high despite the adoption of an interconnection determination. This can be attributed to the 30% duty levied on cell phones and services, which significantly raises mobile prices.

Tariff regulation in Namibia is perceived negatively since there has not been any. MTC has been able to create club effects using high off-net/on-net price differential and bundled on-net minutes and SMS.

The inability of the Zambian regulator to regulate tariffs and Zain's dominant position accounts for the negative perception. The new ICT bill of 2009 compels regulator to protect consumer welfare against high tariff rates, which is likely to change the perception in the future.

Tariffs in Kenya are still very high due to the lack of competition. In addition, the regulator has encountered a number of obstacles in bringing down tariffs. One of the main obstacles is the resistance from the dominant mobile operator, Safaricom. Its resistance has resulted in the suspension of the implementation of the new regulation about tariffs, despite the new framework having been published within the government gazette.

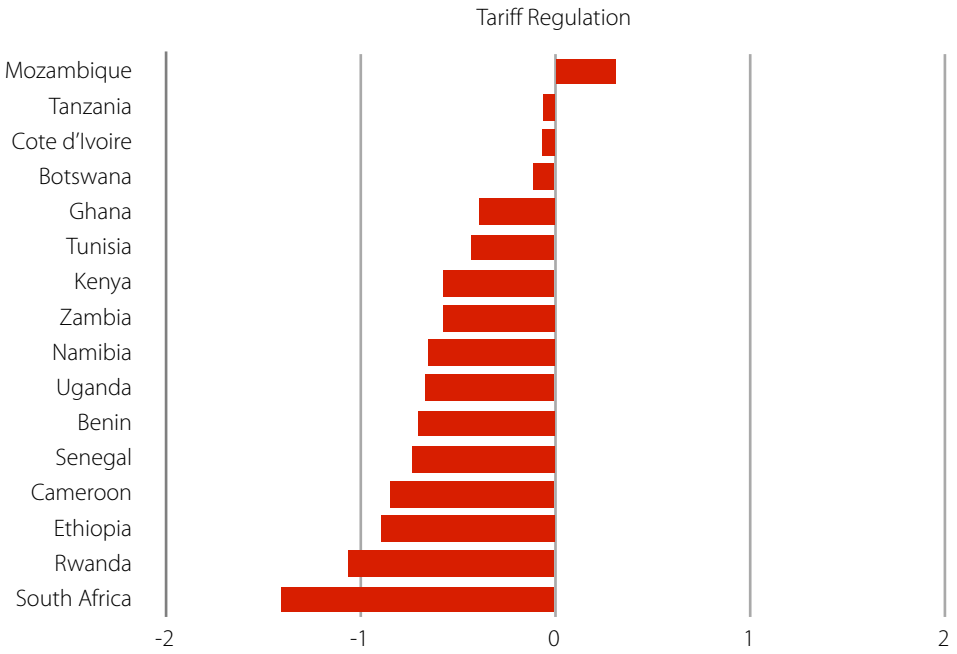

Figure 14: RIA TRE 2009 – Tariff regulation

In Ghana, regulation regarding tariffs is perceived as inefficient. Apart from the fixed-line segment, whose tariffs are regulated, the telecommunications policy left the determination of mobile prices to market forces. The only case where the regulator intervened was in relation to the high cost of international bandwidth on the club consortium SAT3 facility. In this case, the regulator intervened as a result of vigourous lobbying by the Internet Services Providers (ISPs). Consequently, the price of 2 megabytes duplex dropped from USD 12,000 a month to USD 4,500.

In Botswana, the Botswana Telecommunications Authority regulates tariffs by setting a ceiling on prices. As a result, operators can charge anything below the set price. However, mobile prices are considered to be high and thus the regulator is perceived as inefficient in regulating tariffs. However, the regulator commissioned a study, which looks at developing a cost and pricing framework for Botswana. The model is supposed to be implemented towards the end of 2010.

In Cote d'Ivoire tariff regulation is perceived negatively due to the absence of tariff regulation. Operators set the prices, while the regulator acts as an arbitrator to protect consumer interests. Moreover there have been large variations in the pricing of services within the same market segment, which affects consumers. As a result, the regulator is conducting a study to determine a price model that will be beneficial to all operators.

Tanzania is considered to be relatively inefficient in regulating tariffs. The country has one of the highest mobile prices out of all the countries surveyed, despite reducing the call termination rate. Additional levies and taxes have driven up tariff rates. In fact, telecom equipment is subject to 20% import duty and 20% VAT and 7% tax is levied on mobile airtime.

The negative perceptions about tariff regulation do not have a uniform impact in terms of pricing across the different countries. For instance, Ghana is perceived to be inefficient in regulating tariffs, but has the lowest mobile prices out of all the countries surveyed. The low ranking of tariff regulation in Ghana is based on the fact many subscribers want the regulator to play a more pivotal role in mobile pricing rather than leaving it to the market, which they think might not serve their interest. Further, there is still a strong perception that prices could still come down as the operators have not hit the end of the pricing mechanism. These underlined the poor rating of tariff regulation in Ghana. Ethiopia's mobile pricing is fairly low, despite the absence of regulation on tariffs. Instead tariffs are set through a political process. Moreover, in South Africa, high prices correlate with the negative perception.

Regulation of Anti-Competitive Practices

The ability of the regulator to prevent anti-competitive behaviour is a key determinant of investment for new entrants. Operators with significant market power are able to engage in predatory pricing practices, thereby undermining smaller players, which is deemed anti-competitive practice.

In Botswana the positive perception in anti-competitive practices is due to the high score under the VANS market. The fixed line market had a marginally positive score whilst the score in the mobile sector was negative. B-mobile is perceived to have an unfair advantage in the market in terms of pricing and the range of services offered – it is the mobile arm of the incumbent operator. Although, there is increased competition in the fixed-line market, the incumbent Botswana Telecommunications Corporation maintains dominance over the market.

The positive score in Mozambique relates to the facilitative role played by the regulator in splitting the incumbent operator TDM and MCel, its mobile arm, into two separate companies prior to the entry of Vodacom as the second national operator. In addition there have been no disputes over anti-competitive behaviour. The moderate negative score in the fixed and mobile markets can be attributed to the fact that in the past the regulator has been reactive as opposed to being proactive with regard to regulating anti-competitive behaviour in the past.

The majority of the countries in the figure above were regarded as ineffective in the regulation of anti-competitive practices. In the case of Ethiopia, there is no regulation on anti-competitive behaviour due to the absence of competition in the mobile, fixed and the Internet market segments.

The majority of the countries in the figure above were regarded as ineffective in the regulation of anti-competitive practices.

In South Africa, despite the entry of new market participants, the incumbent operator retains dominance over the backbone. There have been several complaints of uncompetitive practices lodged with the regulator against Telkom, from whom downstream operators were required for many years to acquire their facilities. Despite several challenges by competitors to Telkom, and the regulator ICASA ruling against Telkom, these have been taken on review by the incumbent. Some reviews have been successful on procedural grounds, while others cases have languished in the courts for year. As a result, a number of disputes have been brought before the Competition Commission. In South Africa, comments in relation to the negative perceptions about anti-competitive behaviour appear to refer to the regulator and not the policy and regulatory environment as a whole. It is important to note that the Competition Commission is often overlooked when assessing the regulatory environment, although it has had a number of successes.

Namibia has a negative perception regarding anti-competitive practices is perceived negatively due to the fact that the NCC has not been able regulating tariffs and also does not have regulatory power over Telecom Namibia, which is reported as having acted anti-competitively in the past.

In Zambia, the negative perception of anti-competitive practices relates to the lack of regulation of Zain's dominant market position. However, a new legal framework for regulating anti-competitive practices has been provided in the new ICT bill, which came into effect in December 2009. This expected to provide the regulator and the competition authority with necessary legal powers to institute effective economic regulation in the sector.

In Benin, some of the operators have complained that the sales promotions for products and services are uncompetitive and that competitors were engaging in unfair competition. Anti-competitive behaviour pertaining to sales promotion was unregulated until October 2009, which accounts for the negative perception. Following growing complaints from GSM operators, the Transitional Regulatory Authority for Post and Telecommunications took a decision to regulate the practice of sales promotions. Decision No. 022/ATRPT/PT/SE/DAJC/SA includes procedures for organising sales promotion products and telecommunications services in Benin. the sales promotion of products or services of telecommunication are now subject to prior approval from the regulatory authority.

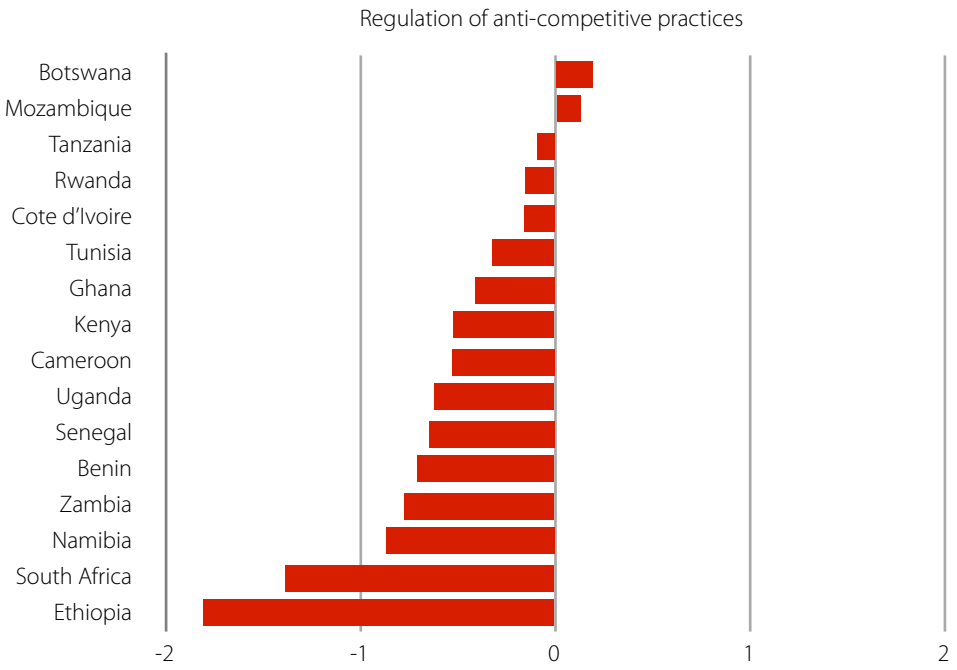

Figure 15: RIA TRE 2009. Regulation of Anti-competitive practices

In Senegal the regulator does not regulate anti-competitive practices and does not have the scientific tools to do so, which accounts for the negative perception.

In Uganda the perception of anti-competitive behaviour is negative because dominant operators tend to influence the way the market operates and since the regulator has a hands-off approach, stepping in only when the players fail to agree, it is easier for dominant players to have their way. A good case in point was when the regulator tried to set a base-interconnection rate for mobile telephony across networks and one of the major players went to court to challenge them. Later the matter was settled out of court, which creates the impression that the regulator does not adequately address anti-competitiveness.

In Cameroon, regulation of anti-competitive behaviour has not been a priority for the regulator, given the market structure of a duopoly in the mobile market and monopoly in the fixed-line market, which accounts for its negative perception. The announced entrance of two new mobile operators, however, is expected to impact on the operator's behaviour. It can be anticipated that the two main operators will try to protect their dominant positions by adopting predatory pricing practices. The engagement in anti-competitive practices will require the Ministry of P&T to monitor and perhaps regulate this dimension.

In Kenya, despite the introduction of competition into the telecommunications market, incumbent operators continue to dominate the market. Furthermore, the regulator has not taken up its full mandate to regulate uncompetitive practices. A bottleneck of the regulation of anti-competitive practices is the lack of a clear definition of what is considered a dominant operator. Consequently, operators that command significant market power are able to behave anti-competitively.

In Ghana, one of the main unresolved regulatory issues is the high cost of leased facilities and preferential treatment being experienced by Vodafone Broadband4U for SAT3 connection from the parent company. As a result, prices for access to SAT3 are not uniform for all operators. The current situation has resulted in distortions in Internet pricing. For example, Vodafone Broadband4U price for 512kb is US$39 per month, while Internet Ghana and Busy Internet (shared) charge US$ 274 and US$350 per month respectively. The ISPs have argued strongly that Vodafone Broadband4U cannot charge or Internet pricing will not be sustainable it pays same price for 2mb duplex link on SAT3. There is another argument that since there is no separation of accounting system among the three services (fixed line, mobile telephone and broadband Internet) provided by Vodafone, the likelihood of cross-subsidisation of services within the company may be possible. This situation has prevented the entry of effective competition in the broadband Internet market

The negative perception of Tunisia with regard to the regulation of anti-competitive practices reflects the fact that until very recently only one public network operated all the segments: fixed, mobile and Internet.

Cote d'Ivoire's negative perception can be attributed to the fact that the body responsible for arbitration over disputes – CTCI – suffers from a lack of execution. A Competition Commission has been created but is currently non-functional, and therefore the abuse of dominant positions and other anti-competitive practices are not addressed.

In the majority of the countries surveyed, the liberalisation of the telecommunications sector has not been accompanied by regulation of anti-competitive behaviour from dominant operators. As a result, penetration rates in Africa remain low in comparison to other regions. Therefore, regulators are challenged to regulate anti-competitive behaviour in order to keep the markets competitive and attract new market entrants and investors, thereby stimulating market growth.

Universal Service Obligations

In order to promote ICT investment in under-served areas, African countries have adopted Universal Access principles, with the intention of providing access to ICT services within marginalised communities. Universal Access Funds (UAFs) were created with the objective of subsidising telecommunications operators to boost investment activities related to ICT infrastructure development and extension to perceived non-profitable areas.

Although several countries have established UAFs and often dedicated agencies to ensure their implementation, these have not yielded the intended results.

Although several countries have established UAFs and often dedicated agencies to ensure their implementation, these have not yielded the intended results. On the one hand, there have been regulatory bottlenecks regarding access to and allocation of the money, such as the absence of processes and procedures regarding how the UAFs function. As a result, there have been discrepancies between funds collected and the actual amount disbursed. Billions of dollars that could have been deployed remain under-utilised in UAFs across the continent. In addition, there have been delays in the disbursement of funds due to lengthy bureaucratic processes.

Botswana is perceived as highly efficient regarding regulation on universal access. The positive perception seems to relate to increased awareness of the Universal Access Policy draft, which is yet to be tabled before cabinet. In addition, evidence of the outcomes of universal access initiatives is yet to be seen.

While, the perception in Mozambique is positive regarding the regulation of universal access, this does not correlate with the outcomes of the project. A universal access fund was established in 2004 and became operational in 2006. However, none of the funds were disbursed until 2008 with only about a quarter of the money spent. Organisational challenges and limited capacity has hampered the effective management of the fund. The universal access and service unit is run by a single person who is responsible for the technical, financial and administrative aspects of the universal access fund. In addition, the institution lacks clear and simplified procedures on submission and selection criteria for universal access project proposals.

In Tunisia the development of basic telecom access to cover urban as well as rural population has always been a major priority of the Tunisian Socio-economic Development policies for the last 40 years. This priority has been confirmed in the telecom code of 2002 and 2008. The latest one adopted the nomenclature of Universal access for basic services.

Tunisia established universal service obligations in 2001, with the objective of extending minimum telephone services to citizens all over the country and to provide a free of charge routing service for emergency calls. Also, the two main operators are required to publish a directory of subscribers, in print or electronic form. The legislative framework takes into account only the availability of the telecommunications services (i.e. to provide an equal level of basic communications service all over the country), but it does not mention issues of affordability and accessibility. The positive perception of Tunisia with regard to universal access obligations might be due to the 2008 telecommunication Act (Act no. 2008-1) which replaced the concept of basic telecommunications services, defined in the 2001 law, with those one of universal service. However, despite this formal commitment to improve the programme through the inclusion of aspects related to affordability and accessibility, so far the list of obligations did not develop from 2001. It might be attributed to a ministerial delay, since the list of universal service obligations has to be defined by order of the Ministry of telecommunication. Tunisia did not establish a universal access and service fund, but through obligations for operators a minimum access and free of charge relief communications have been achieved. However, the achieved minimum access relates to a geographical coverage of telecommunications services rather than to the usage of the services by the population.

Cote d'Ivoire is perceived as neutral in terms of universal access and service. Within three (03) sectors, universal service obligation is situated under a strategic plan developed by government. Carrying out this process will, in the near future, lead to telecommunication services and products being accessible

to the whole population living in the national territory. The Fonds National des Telecommunications (FNT) was instituted with this in mind. Currently, each telecommunications company sets itself up in accordance with its target market in view of the profitability of its investments.

In Tanzania, the perception regarding universal access and service is perceived marginally positive. Since liberalisation of the telecommunication sector in Tanzania in 2003, for obvious reasons, major investments and developments have happened in major cities and towns. So far, no significant investments have taken place in rural areas. Although the Universal Communications Service Access Act has been in place since 2006, the Universal Access Fund was only established in 2009. It is the process for the mobilisation of such funds that has generated public awareness and interest in this subject. So far, not much has been achieved. The incumbent (state owned) communication operator TTCL, is expected to be the precursor in this venture. Unfortunately, it seems to lack the vigour and innovation commensurate with USO challenges. TTCL has been a follower rather than a pioneer in the mobile communication sector which has the greatest potential to fulfil universal service obligation requirements.

South Africa is perceived as highly inefficient in the regulation of universal access. Despite the appointment of new leadership in the renamed Universal Service Agency of South Africa (USASA), it is still dealing with definitions of "universal access" and "needy people" which have yet to be determined by the Minister as required by the 1996 legislation. Despite longstanding universal services levies amounting to billions of rands, various initiatives, such as under-serviced licences, public Internet terminals and supply-side driven tele-centres have proved unsuccessful.

The absence of universal obligations in preceding years accounts for the negative perception in Zambia. Only in 2009, with the adoption of the ICT Act, Zambia makes provision for the establishment of a universal service fund.

In Ethiopia, a Universal Access policy and strategy is absent. However, the incumbent operator has made progress in providing access to underserved areas through its rural infrastructure rollout project.

In Namibia a universal access fund has not been established which accounts for the negative perception.

Benin has a negative perception due to the absence of a universal service fund and regulation on universal access and service, although operators are required to pay 1 % of their turnover each year to the regulator in order to establish a universal access fund.

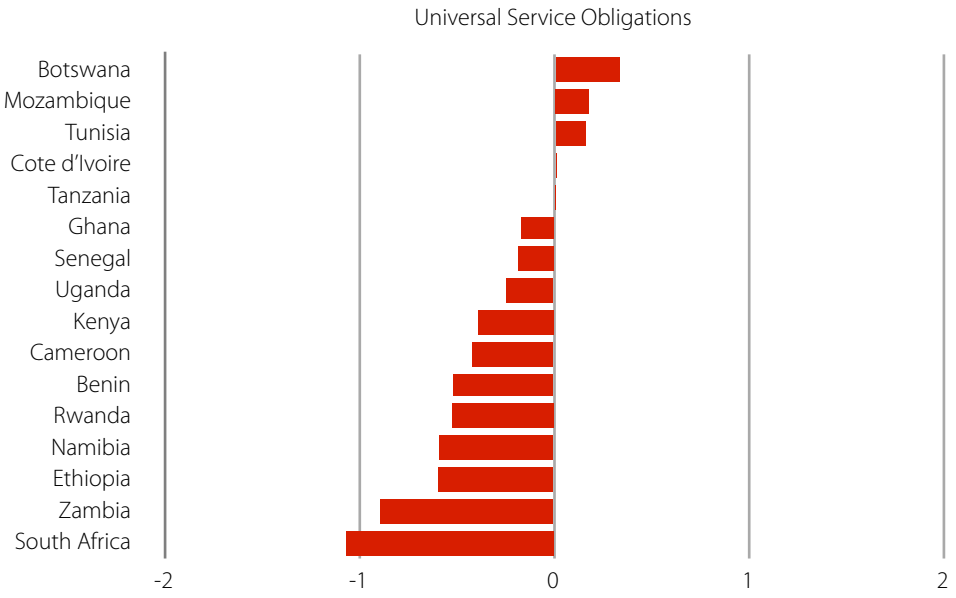

Figure 16: RIA TRE 2009. Universal Service Obligations

In Cameroon, the negative perception of the regulation of universal service obligations is as a result of the absence of a policy targeted at expanding communication services in rural and perceived uneconomic areas. In addition, the government tele-centre strategy has been criticised for yielding poor results. The government announced that it was launching 2000 tele-centres by the 2010 as part of its universal and access strategy. In 2009, less than 200 tele-centres were set up and there has been controversy over the manner in which the tele-centres are managed. Another consideration might have tainted people assessment. Between 1999 and 2005, a long power struggle opposed the TBR to

the Ministry of P&T about who was in charge to manage billions of CFA francs paid by the telecom operators every year as their USO contributions. In 2006, the National Assembly passed a Law giving the control over USO money to the Ministry. Since then, every year, the Ministry launches a call to proposals for various realisations targeting rural populations or underprivileged areas. The score shows that the beneficial effect still yet to be ripped.

Despite the perception, the government has adopted the Universal Access principles and claims to provide access to ICT services to all citizens by year 2025.

The poor perception of universal access regulation in Kenya reflects that there was not strategy until 2009. The amended Communications (Amendment) Act 2009 allowed for the establishment of a universal service fund from a levy on licensees but this has not yet been implemented. This has received resistance from the mobile operators because in their view they are meeting the universal service obligations but according to CCK sector statistics (March 2010) the mobile population coverage is 84.5% but the land coverage is only 34%.

With regard to universal service and access obligations, the licence obligation required TKL (incumbent) to install 285,000 and 25,000 new lines in urban and rural areas respectively during the period of exclusivity (June 1999 to June 2004). The company was also supposed to increase the number of pay-phones by 22,500. TKL failed to meet these minimum targets stipulated in the licence. This failure was supposed to attract a fine of Kshs 58 million which is far less than the amount it would have cost TKL to roll-out 200,000 additional lines. The two mobile service providers Safaricom and Celtel, had rollout obligations as well, but these have been attained and even surpassed. Celtel had connected 600,000 subscribers, a figure above the obligation requirement of 345,354 lines by December 2003. Celtel had the obligation to install 1,000 fixed public pay-phones but had managed only 814 by the end of 2003.

In 2003, Uganda launched a rural access program. The funding for the Rural Communications Development Program (RCDP) is derived from the 1% levy of gross annual revenue of the operators. This is supplemented by donor support and grants from organisations such as the World Bank as well as other allocations by Ugandan Communications Commission. The Fund has recorded total annual receipts of up to US$3million and utilisation of these is around 85%.

A number of projects have been implemented through the RCDP as shown in the table below. Although the program has been widely acclaimed and has fulfilled a number of its objectives as shown in the table, the performance is perceived as inefficient, since the impact assessment of its activities in the communities in which they have been implemented and towards national development is not yet known. However, UCC has commissioned a study to assess this impact.

Table 14: Projects executed under the RCDP as of August 2009

Project	Number Implemented
Internet Points of Presence	76
Internet Cafés	99
ICT Training centres	79
Web Portals	78
Public Pay Phones	2599
Research projects	6
Postal support projects	35
Multipurpose Community Tele-centres	24
School ICT facilities	95
Health ICT facilities	43
Call centres	1
Content development	nil
Charging facilities for Community Information Centres	nil

(Source: UCC)

In Senegal the performance is perceived slightly inefficient. In fact, despite a 2007 Act provides the legal framework for the establishment of the universal access fund it became operational only in 2010. During this year, a total amount of only 7 billion FCFA from a 3% levy on operators' turnover has been collected, but it has not been disbursed yet.

In Ghana, the Electronic Communica-tions Act of 2008, provided a legal basis for universal access obligations in the country. The Act established the Ghana Investment Fund for Electronic Communication (GIFEC) as an independent body to manage the country's universal access fund. The GIFEC is considered inefficient in regulation of the fund due to the large amounts of unspent money within the fund. Between 2005–2008, GIFEC's revenues stood at GH¢18,300,000 (US $17.62m) out of which GH¢2,236,000 (US $2.03m) representing 12.2% had been spent over the period. (Any figures) on universal access related projects.

Quality of Services

The level of quality of service is a reflection of the overall regulation of all the aspects within the telecommunications sector. The quality of service is also influenced by the level of investment in infrastructure and network rollout; the number of competitors and prevailing interconnection regime. In addition, level of quality of service has a direct impact on customer church levels.

In Cote d'Ivoire quality of service is perceived as efficient. This opinion is mainly justified by:

- the conformity of equipment/terminals to GSM/UIT standard for mobile telephones;
- the conformity of technical equipment to GSM standards, call quality, connection speed for fixed line telephones;
- connection speed depending on the speed of the connection subscribed to for Internet access provision.

As for Internet access provision, service quality (connection speed) for shared offers, in other words Individual Solutions, as a general rule, is not that suitable for certain Solutions subscribed to. The observation of the constraint of service quality is rather for dedicated speeds of company solutions.

The advent of the CDMA technology by Arobase Telecom in the fixed telephone sector has heavily boosted and stimulated the services offered to clients and in reaction to the quality, even leading the incumbent operator to procure it.

In order to assess the global service quality of the five (05) mobile networks in operation, the ATCI commissions an annual audit. The 2009 classification details of the operators are presented in the table below.

Table 15: 2009 service quality classification of GSM networks in Côte d'Ivoire

	Mobile Networks				
Elements of Evaluation	**Orange CI**	**Moov CI**	**MTN CI**	**Comium CI**	**GreenN**
Best network – general classification	1st	2nd	3rd	4th	5th
Best network – classification over Abidjan	4th	1st	2nd	5th	3rd
Best Radio Coverage	2nd	5th	1st	3rd	4th
Best Network Availability	2nd	1st	5th	3rd	4th
Best VOICE Service	2nd	1st	3rd	4th	5th
Best SMS Service	1st	3rd	4th	2nd	5th
Best DATA Service	1st	2nd	4th	5th	3rd

Source: ATCI (2009), audit report on quality of mobile networks in Côte d'Ivoire, reorganised data

Orange CI is classified as the best mobile network in Côte d'Ivoire in 2009.

In Botswana, operators are required to submit monthly network performance reports to the regulator detailing the status and performance of their networks in terms of set parameters of quality of service. This has resulted in a positive perception of the regulator with regards to quality of service. In order to protect, consumers the regulator carries out investigations on the use of telecommunication equipment in order to determine the state of illegal operations within the telecommunications market.

In Tanzania the perception on quality of service is positive. The liberalisation of the communication sector coupled with good regulatory and legal framework has created an attractive environment for new entrants in the business. The resulting competition has forced improvements in the quality of service as well as lowering the cost of communication. The mobile phone has touched the lives of majority households in Tanzania. The public perception on 'quality of service' is mainly shaped by the quality of the basic service, namely the ability to communicate. It is possible that if the quality of each type of service was rated, the results could be different. Customer service, for one leaves much to be desired.

Mozambique's positive score does not reflect the real situation. There have been frequent violations of quality parameters without any disciplinary measures taken by the regulator, although the telecommunications act empowers the regulatory authority to put in place control mechanisms regarding quality of service. For example MCel's quality of service is widely perceived to be poor went unpenalised until 2010. One possible explanation for the positive score could be that there are currently visible efforts towards the establishment of a regulatory framework for quality of service. According to a recent note from INCM, the draft document has been prepared for approval.

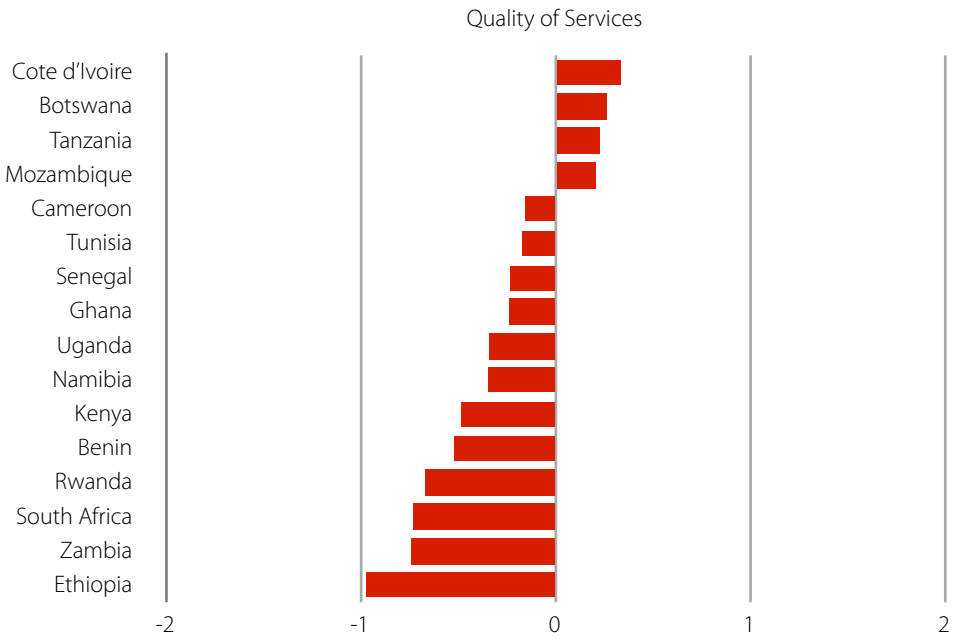

Figure 17: RIA TRE 2009. Quality of services

In Ethiopia, if compared with the RIA TRE 2006, the quality of services has been falling. The low quality of service is a result of the overall bad performance of the telecommunications regulatory environment. Despite improved network penetration over the last five years, through a vendor sponsored loan programme, the incumbent monopoly did not have an incentive to improve the quality of service due to lack of competitive pressures and inherent inefficiency.

Regulation of quality of service is perceived negatively in Zambia, although the regulator formulated quality of service standards for fixed and mobile voice services and invested in a quality of service monitoring system independent of the operators. This has not resulted in significant improvements in the quality of services. In addition, the failure of the regulator to impose penalties in line with the standards has contributed to the negative perception. Moreover, the regulator is compelled under the new ICT Bill to protect consumer welfare against poor quality of service.

In Zambia the Authority recognises the need to protect the interests of consumers of ICT services and therefore endeavours to closely monitor the provision of licensed telecom services. While the quality of experience is critical to consumer satisfaction, the Authority recognises that matched quality of service and network performance are equally important for an effective quality of service framework. The licensing framework provides for licensed operators to offer a minimum level of quality of service as stipulated by the Authority.

In order to assess the quality of service level from a user's point of view, the Authority has invested in an advanced quality of service monitoring system, independent from the operators, and it installed monitoring stations in Livingstone, Lusaka and Kitwe to continuously and objectively measure the quality of service against parameters such as speed, accuracy and dependability as per ITU E.431 recommendation. Specifically, call success rate, SMS delivery time and voice quality are some prominent parameters measured.

In the past, enforcement of quality of service standards has been constrained by low penalties. As a result, the Authority resorted to a name and shame strategy in lieu of a comprehensive penalty system. This situation has been remedied with the enactment of the Zambia ICT Act of 2009, which empowers the regulator to effectively monitor and enforce quality of service standards.

The Authority will soon implement the quality of service framework that would ensure that the quality of service and Network Performance parameters are closely matched. This would ensure adherence to license conditions as well as improve consumer protection.

South Africa' s negative perception relates to the absence on regulation on quality of service in telecommunications.

In Benin the perception of quality of services is negative due to customer complaints about the quality of service on both fixed and mobile networks. Other complaints include a low signal in some parts of the country and congestion on mobile networks.

In Kenya, the quality of mobile calls has not been addressed adequately. It is considered the main challenge in the mobile segment. Also, the quality of service for ISPs needs to be defined and benchmarked. In 2007 the CCK implemented a quality of service monitoring system called Q-voice, at a cost of Kshs 50 million (USD 760 000), the expected benefits of which have not been achieved. This could be partly due to a lack of a structured method of communication between customers and the regulator in the past. However, in the past two years a dedicated directorate of consumer affairs was set up to deal with consumer issues, though there are no evident positive results as yet. The CCK is actively educating consumers through their website on their rights in relation to quality of services on communication services from the providers.

In Namibia the negative perception about quality of service can be attributed to customer complaints on the quality of service on mobile networks, including dropped calls and congestion on networks. In addition, there is no regulation or process in place to monitor quality of service.

Uganda has a negative perception regarding quality of service because this issue has not been at the forefront of the regulatory agenda. Although the regulator supposedly monitored quality of service, results were not published in publicly accessible media. As a result, users could not easily compare the performance of different providers in any meaningful way. The regulator has started to increasingly pay attention to quality of service issues, partly due to a rise in consumer complaints through consumer lobby groups. The regulatory authority, UCC, has started to publish some quality of service information under its "name and shame" policy, which compares the performance of different providers across a number of metrics in the public media.

Quality of service is also influenced by the level of investment in infrastructure , network rollout, the number of competitors and prevailing interconnection regime.

In Ghana, where mobile subscribers represent 85% of the total telephone subscribers, the quality of services has not been adequately addressed by the regulator. Issues such as dropped calls, traffic congestions and poor reception among others still persist in this market segment. Taking into account the good performance in market entry, most operators have embarked on a subscription drive without a corresponding expansion in their network capacities, and it has created network congestions. In November 2007, following a series of complaints on the level of quality of services, the regulator imposed heavy fines on MTN and GT OneTouch (now Vodafone Ghana). The operators were ordered to improve the quality of their networks or face further sanctions. However, the regulator withdrew the directive after few months without any significant improvement in the quality of service. The regulator has been unable to apply sanctions for non-compliance or improve the quality of services.

Senegal is perceived as inefficient in regulating quality of service although the level of quality of service is monitored throughout the year by the Regulation Agency of Telecoms and Post (ARTP). However the regulation is not effective because the group responsible for monitoring quality of service does not work closely with the Consumer's Association. As a result, consumers that experience poor quality of service are not aware of the existence of regulation and do not have a channel to voice their complaints.

While the quality of services in Tunisia for mobile has been regarded as acceptable, in the area of broadband there has been a negative perception of regulation of quality of service. The quality is uneven, speed erratic and deployment is insufficient in some areas and/or regions. Low bandwidth contributed to low quality of service. Quality of service has improved following increases in bandwidth availability.

In Cameroon, the negative score is attributed to a decrease in the quality of service perceived by users. This negative situation reflects both a regulatory impasse in addressing the quality of service, and the increase of the number of subscribers using an inadequate infrastructure. In order to improve network capacity, the incumbent is investing in fibre optic. This roll out of this public funded infrastructure is expected to improve the quality of service and to prevent the frequent overlapping and breakdown of conversations.

Conclusions and Recommendations

While Africa's telecommunications sector continues to grow, outcomes are sub-optimal in comparison to other regions of the world. While growth of the mobile market has been dramatic, sub-Saharan countries lag behind many other developing regions, including North Africa. For almost 15 years, the telecommunications sector has been part of the multi-lateral trade of services agenda. As a result, several African countries have undergone a telecommunications reform process in order to meet international trade agreements, including the functional separation of government, the sectors' regulator and operators. However, the reform process has been uneven across the continent. Although most reform processes in Africa are incomplete, a number of regulators have adopted unified/converged licence regimes in order to keep up with the trend of convergence of technology world wide.

Despite rhetorical commitments by governments to regional integration, regional economic communities are struggling to integrate their economies as well as their telecommunications regulatory frameworks. This can be attributed to national priorities take precedence over regional objectives. East Africa, however, continues to demonstrate the benefits of regional integration, most recently through the termination of roaming charges within the region. Other operators within the region have replicated the One Network initiated by Zain, formerly Celtel and now Bharti-Airtel.

Despite most of the African countries having liberalised their telecommunications sectors to some degree, access and affordability of services remain uneven and very low when compared with other regions of the world.

In recognition of the role ICT plays in stimulating economic growth and development, some Africa countries have adopted ICT-led development policies and are undergoing reforms in order to stimulate foreign investment in infrastructure. In most markets in which such data is available, the rate of growth of the ICT sector is considerably faster than the overall rate of economic growth. and the contribution to GDP is expanding to give a major sector in some of the more dynamic ICT markets in East and West Africa. The drivers for increased ICT revenue can be attributed to the liberalisation of the telecommunications sector, which opened up markets to competition, driving down prices and extending the range of services available, especially when supported by effective regulation.

While the private sector has led ICT investment on the continent over the last decade, the return of state involvement is evident with governments increasingly playing a lead role in financing backbone infrastructure, either through the deployment of state capital or through public-private initiatives. With the onset of the global economic crises and the retraction of European investment interest, Africa has witnesses the rise of a new set of multinational investors from emerging economies, namely India and China.

This comparative study highlighted the fact that despite most of the African countries having partially or fully liberalised their telecommunications sectors to some degree, access and affordability of services remain uneven and very low when compared with other regions of the world.

The fixed-line sector continues to show no signs of recovery as most countries experienced negative growth between 2006 and 2008. Failure to liberalise the fixed-line segments, extended monopolies and ineffectual regulation of the incumbent account for low penetration rates. Sequencing problems, including the delays in the establishment of autonomous regulators and the failure to open up markets prior to privatisation undermined the extension of fixed services. In the face of rapidly deployable wireless technologies by new market entrants when markets were opened, with innovative pricing that tapped into the demand for low access charge, affordable communications services made it very difficult for fixed networks with huge sunk costs and high access prices to compete with mobile phone services.

The cost of communications remains high across the continent, putting it out of reach of the general African population. The input cost of communications into other services and industries continues to be a barrier to investment and improved growth through the deployment of competitively priced communication services to improve the efficient supply of goods and services. In addition, sector specific policies, such as universal service levies and special taxes on ICT equipment and services drive up the costs of services. Wholesales charges for leased lines and international bandwidth continue to be way above cost, as are interconnection rates in most countries, contributing to stifling of competition and high prices for end users.

Mobile penetration rates continue to demonstrate significant growth, but these figures tend to mask the fact that millions of Africans still do not own their own means of communication or cannot afford to use mobiles. Despite the high proliferation of low-cost handsets, in some poorer sub-Saharan African countries like Uganda and Tanzania penetration remains low. Affordability of mobile telephony remains a challenge. While reduction in the cost of devices is driving access, pricing of services remain a constraint on the usage, particularly when affected by regressive

special taxes levied on communications and equipment, which is as high as 30% in Uganda. As such pricing remains the key focus on the regulatory agenda.

The broadband market is still in its infancy with Internet use mainly through work or school. Household Internet access remains pitiful. These poor showings can partly be attributed to the high cost of bandwidth due to the limited infrastructure backbone. Until 2009, most countries had limited connectivity, mainly through SAT3, owned by some of the larger incumbent operators on the continent through a club consortium. In many instances incumbent operators had a monopoly over international data gateways as well. Where operators, other than incumbent fixed-line operators, were allowed to use VSAT or other satellite connectivity, it at had been at a high cost, which therefore limited access to services. The landing of the SEACOM cable provided much needed bandwidth capacity and reduced the cost of services in terms of dollars per MB. There are extensive plans by NEPAD to connect the interior of the continent to the cables. Mobile operators, unwilling to wait for these and other backbones to be built, are playing a key role in the roll-out of the fibre backbone infrastructure.

Policy and regulatory developments in Africa are highly uneven, with considerable gains in some countries, such as the move towards cost-based termination rates, and continued political interference in the regulatory processes in others.

Policy and regulatory developments in Africa are highly uneven, with considerable gains in some countries, such as the move towards cost-based termination rates, and continued political interference in the regulatory processes in others.

Some significant regulatory interventions affected the general perceptions of the telecommunications policy and regulatory environment on the continent. In many cases, what is attributed to the failure of the regulatory actions, most fundamentally market entry – the main driver of competition within the sector – are in fact policy constraints over which the regulator has no or little say. Likewise, the regulatory failure to act attributed to the regulator often reflects the institutional arrangements and political constraints on its autonomy, for which it is not responsible.

Open market access is a necessary condition to facilitate competition, which in turn is expected to drive down prices and access; but the study argues that there are other regulatory factors that influence market outcomes, such as interconnection, tariffs regulation, management of scarce resources, and taxes and levies.

The management of scarce resources has a direct effect on investment and influences the level of competition and innovation. The challenges regarding the effective use of scarce resources relates to the lack of reform of out-dated telecommunications policies, which stifles market growth.

High tariffs are a key barrier to the access of services. Tariff regulation across the markets surveyed is perceived as ineffective. Generally, high prices are an indication of the lack of competition, as in the case of South Africa. In some cases, markets are competitive but prices remained high due to taxation, such as in Tanzania and Uganda. In other markets prices are politically determined or set through competitive forces such as in Ghana.

Another factor impacting on price and accessibility is interconnection. Although a number of countries have had interconnection determinations, this has not meant lower retail pricing. However, in countries such as Namibia, where interconnection disputes were addressed through cost-based determination, retail prices have decreased and the number of subscribers have increased.

The majority of countries surveyed perceived the regulation of anti-competitive behaviour negatively. There has been a rise in competitive disputes as competition has increased through the liberalisation process. However, African countries have opened up their markets to competition, without completing the telecommunications-reform process. As a result, issues that relate to monopolistic practices by incumbent operators, as well as anti-competitive practices by dominant operators, are not addressed.

Universal strategies have been adopted across the continent with the aim of increasing access in rural and perceived uneconomic areas. As a result, Universal Access Funds (UAFs) have been established to meet these objectives. However, most of the UAFs have not been utilised, and in cases where the funds have been disbursed the outcomes have been sub-optimal.

With the liberalisation of the telecommunications market and the increase in the number of operators, some countries experienced a decline in the quality of services. In most countries, the quality of services has not been a priority for the regulator, while in others regulatory interventions have had a limited impact on the quality of services.

Clearly, if Africa is to meet the central policy objective of providing accessible and affordable communications services to its citizens, governments are challenged to establish autonomous and publicly accountable regulatory regimes that are adequately resourced and skilled to regulate this dynamic sector effectively.

Finding	Cause	Recommendation
Constraint mobile access and usage	Competitive constraint	Enable market entry
High cost of mobile calls	High termination rates	Cost based call rates
Poor Internet access	Poor uptake of connected PC and home ownership of PC High cost of Internet services, primarily as result of high network costs, particularly international bandwidth	Demand stimulation of home PC ownership and connectivity. Ramp up public access focusing on schools and IT literacy programmes. Promote international cable and terrestrial network competition or essential facilities regulation and open access policies
Poor broadband penetration	Lack of infrastructure investment. Poor network extension and quality of fixed network not suitable or available for upgrading. Most handsets not enabled for broadband or are too expensive to use for that purpose	Examine investment strategies for network extension (public private partnerships, structural separation of networks and services of incumbent) and competition and/ or open access strategies.
Ineffective universal service strategies	Regulatory bottlenecks regarding access and allocation of fund money. The absence of processes and procedures on how the funds should function. The UAS service strategies do not take into account the converged technology environment	Create policies, processes and procedures on how the UAS funds should function and how fund money should be allocated Address source of Expand definition of Universal Access to take into account converged technologies
Absence of competitive environment despite introduction of converged licensing regimes	Incomplete reform processes which created barriers to market entry Regulatory barriers to competition reinforcing the dominance of incumbent operators Absence of policies addressing dominant operators and anti-competitive behaviour	Remove regulatory barriers to competition to enable a non-discriminatory open access regime Create policies that address dominant users and anti-competitive behaviour
Lack of infrastructure investment. Poor network extension and quality of fixed network not suitable or available for upgrading. Most handsets not enabled for broadband or are too expensive to use for that purpose. Absence of regional integration	Limited public finances, policy often constrain competitive investments and alternative funding arrangements such as public private partnerships often not explored	Remove barriers to investment and enable an open access non-discriminatory regime The UAS fund must not be financed using operator levies but through the general tax system The definition of universal access must be expanded to include converged technologies and high-speed broadband infrastructure Provide incentives to encourage investment in underserved and perceived uneconomic areas
Lack of regulatory and policy capacity	Institutional arrangements constrain necessary autonomy of regulator to be effective as do their competencies and skills in some instances, to perform the job	Participatory policy process, transparent appointment process, public accountability, and independent funding arrangements

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Appendix

Table 16: RIA countries' GATS commitments

Country	Year of WTO Accession	Commitments on Telecommunications	Limitations
Benin	1996		
Botswana	1995		
Burkina Faso	1995		
Cameroon	1995		
Cote d'Ivoire	1995	Commitments annexed to the Fourth Protocol on Basic Telecommunications (from 1997 onwards) Committed to the Reference Paper on regulatory principles.	Monopoly provision for 10 years for voice service over fixed infrastructure. Open market access was offered for all other basic telecom services.
Ghana	1995	Commitments annexed to the Fourth Protocol on Basic Telecommunications (from 1997 onwards) Committed to the Reference Paper on regulatory principles.	Committed to maintain duopoly in voice telephone services over a 5-year exclusivity. Full competition in data transmission, Internet and Internet access. Commitment on mobile services with the reservation that cross-border voice services can only be supplied through commercial arrangements with the duopoly operators.
Ethiopia	/		
Kenya	1995	Uruguay Round Commitments (complete UR commitments including value-added telecommunications) (1994-1995)	Until 2003, monopoly on supply of services in Nairobi as well as on supply of International gateway facilities services, and resale in monopoly areas only with permission of supplier of underlying services and facilities. Foreign investment is limited to 30% maximum.
Mozambique	1995		
Namibia	1995		
Nigeria	1995	Uruguay Round Commitments (complete UR commitments including value-added telecommunications) (1994-1995)	
Rwanda	1996		
Senegal	1995	Uruguay Round Commitments (complete UR commitments including value-added telecommunications) (1994-1995) Commitments annexed to the Fourth Protocol on Basic Telecommunications (from 1997 onwards) Committed to the Reference Paper on regulatory principles.	Offered to license additional operators when monopoly rights expired between 2003 and 2006. The number of operators is limited to three in the following services: paging and trunked radio systems. Up to two cellular mobile operators had to be licensed during 1997. Authorities had to establish in 1997 the maximum number of licenses for mobile satellite services.

Country	Year of WTO Accession	Commitments on Telecommunications	Limitations
South Africa	1995	Uruguay Round Commitments (complete UR commitments including value-added telecommunications) (1994-1995) Commitments annexed to the Fourth Protocol on Basic Telecommunications (from 1997 onwards) Committed to the Reference Paper on regulatory principles.	Committed to end monopoly supply and introduce a second supplier by the end of 2003 in public-switched, facilities-based services. Committed to review the feasibility of allowing additional suppliers of public switched services by the end of 2003. Also committed to duopoly supply of mobile cellular telephony. No limitations on the number of suppliers of paging, personal radio communication and trunked radio systems. Foreign investment in telecom suppliers limited to 30%. Offered to liberalize resale services sometime between 2000 and 2003.
Tanzania	1995		
Tunisia	1995	Commitments annexed to the Fourth Protocol on Basic Telecommunications (from 1997 onwards). It did not undertake any regulatory commitments	Competition telex and packed switched data from 1999; in mobile telephone, frame relay, paging and teleconferencing from 2000; in local telephone services from 2003. For all services, foreign equity limited to 49%. From 2002, foreign participation in the capital of Tunis Telecom had to be allowed up to 10%.
Uganda	1995	Unilateral or new accession commitments (basic and/or value-added telecommunications) (after 1995)	International basic voice telephony traffic must be carried through networks of the duopoly major licence holders and other pre-existing licence holders. Neither Uganda Telecom Limited (UTL) nor its affiliates shall hold interests in the Second National Operator (SNO) or its affiliates nor shall SNO or its affiliates hold ownership in the UTL or its affiliates.
Zambia	1995		

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